Drinking Water Surveillance Program

KINGSTON WATER TREATMENT PLANT

Annual Report 1989

Ontario
Environment
Environnement

ISSN 0839-9050

91-05147/

KINGSTON
WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT 1989

Cette publication technique n'est disponible qu'en anglais.

December 1990

Copyright: Queen's Printer for Ontario, 1990
This publication may be reproduced for non-commercial purposes
with appropriate attribution.

PIBS 1385

EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

KINGSTON WATER TREATMENT PLANT
1989 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1989, 65 plants were being monitored.

The Kingston Water Treatment Plant is a conventional treatment plant which treats water from Lake Ontario. The process consists of coagulation, flocculation, sedimentation, filtration and disinfection. This plant has a design capacity of 94.4 x 1000 m^3/day and serves a population of approximately 81,000.

Water samples from the raw, treated and two distribution sites were taken on a monthly basis and analyzed for approximately 180 parameters during 1989. Parameters were divided into the following groups Bacteriological, Inorganic and Physical(Laboratory Chemistry, Field Chemistry and Metals) and Organics (Chloroaromatics, Chlorophenols, Pesticide and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles). Specific Pesticides and Chlorophenols were analysed for in June and November only.

A summary of results is shown in Table A.

Inorganic and Physical parameters (Laboratory Chemistry, Field Chemistry and Metals) were below any applicable health related ODWOs.

Of approximately 110 Organic parameters tested for on a monthly basis, none exceeded health related guidelines.

During 1989 the DWSP sampling results indicated that the Kingston Water Treatment Plant produced good quality water at the plant and this quality was maintained in the distribution system.

TABLE A

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP

SUMMARY TABLE BY SCAN

	SCAN	RAW TESTS	RAW POSITIVE	RAW %POSITIVE	TREATED TESTS	TREATED POSITIVE	TREATED %POSITIVE	SITE 1 TESTS	SITE 1 POSITIVE	SITE 1 %POSITIVE	SITE 2 TESTS	SITE 2 POSITIVE	SITE 2 %POSITIVE
	BACTERIOLOGICAL	36	25	69	36	2	5	24	6	25	36	7	19
	CHEMISTRY (FLD)	34	34	100	72	72	100	71	69	98	120	110	91
	CHEMISTRY (LAB)	252	200	79	252	180	71	296	257	86	443	359	81
	METALS	288	148	51	288	143	49	376	218	57	564	318	56
	CHLOROAROMATICS	154	0	0	154	0	0	98	0	0	154	0	0
	CHLOROPHENOLS	12	0	0	12	0	0	.	.	.	.	.	.
	PAH	174	0	0	189	0	0	.	.	.	.	.	.
	PESTICIDES & PCB	387	0	0	387	0	0	225	0	0	322	0	0
	PHENOLICS	12	9	75	11	8	72	.	.	.	.	.	.
	SPECIFIC PESTICIDES	63	0	0	63	0	0	6	0	0	10	0	0
	VOLATILES	319	0	0	348	48	13	232	32	13	348	48	13
TOTAL		1731	416		1812	453		1327	582		1997	842	

NO KNOWN HEALTH RELATED GUIDELINES WERE EXCEEDED.

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

KINGSTON WATER TREATMENT PLANT
1989 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1989, 65 plants were being monitored.

The DWSP was initiated at the Kingston Water Treatment Plant in January of 1986. An annual report was published for 1986 (ISBN 0-7729-2557-7), 1987 and 1988 (ISSN 0839-9050).

This report contains information and results for 1989.

In order to accomodate the increasing number of plants on the DWSP and to facilitate the timely completion of the 1989 annual reports, plants with two or more years of published data will receive an abbreviated annual report. This report maintains the same general format as in previous years but does not include a comprehensive discussion of results. For more detail on the parameters analysed and discussion of results, consult the 1987 and 1988 reports.

PLANT DESCRIPTION

The Kingston Water Treatment Plant is a conventional treatment plant which treats water from Lake Ontario. The process consists of coagulation, flocculation, sedimentation, filtration and disinfection. Sulphur Dioxide is added for dechlorination. The plant has a design capacity of 94.4 x 1000 m^3/day and sample day flows ranging from 50 x 1000 m^3/day to 67 x 1000 m^3/day.
This plant serves a population of approximately 81,000.

The plant location is shown in Figure 1. Plant Process details, in a block schematic, are shown in Figure 2. General plant information is presented in Table 2.

SAMPLE LOCATIONS

Water samples were obtained from four DWSP approved locations;

i) Plant Raw - The water originated from the wet well prior to chlorination and was sampled through a copper line. The sample tap is located in the plant laboratory.

ii) Plant Treated - The water originated from the highlift discharge after addition of all treatment chemicals and was sampled through a copper line. The sample tap is located in the plant laboratory.

iii) Distribution System - Site 1 - This house is approximately 4.1 kilometers from the plant. Water was sampled through copper plumbing from the basement laundry tap.

iv) Distribution System - Site 2 - This house is approximately 5.7 kilometers from the plant. Water was sampled through copper plumbing from the basement laundry tap.

SAMPLING AND ANALYSIS

Plant operating personnel perform analyses on parameters for process control (Table 1).

Water at the Kingston Water Treatment Plant was sampled for approximately 180 parameters on a monthly basis in 1989. The Specific Pesticides and Chlorophenols scans were sampled for in June and November only. Polynuclear Aromatic Hydrocarbons and Phenolics are only analysed for in the raw and treated water at the plant. As of August the triazine pesticides were only analyzed in the raw and treated water. Laboratory analysis was conducted at the Ministry of the Environment facilities in Rexdale, Ontario.

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM

SITE LOCATION MAP

KINGSTON WATER TREATMENT PLANT

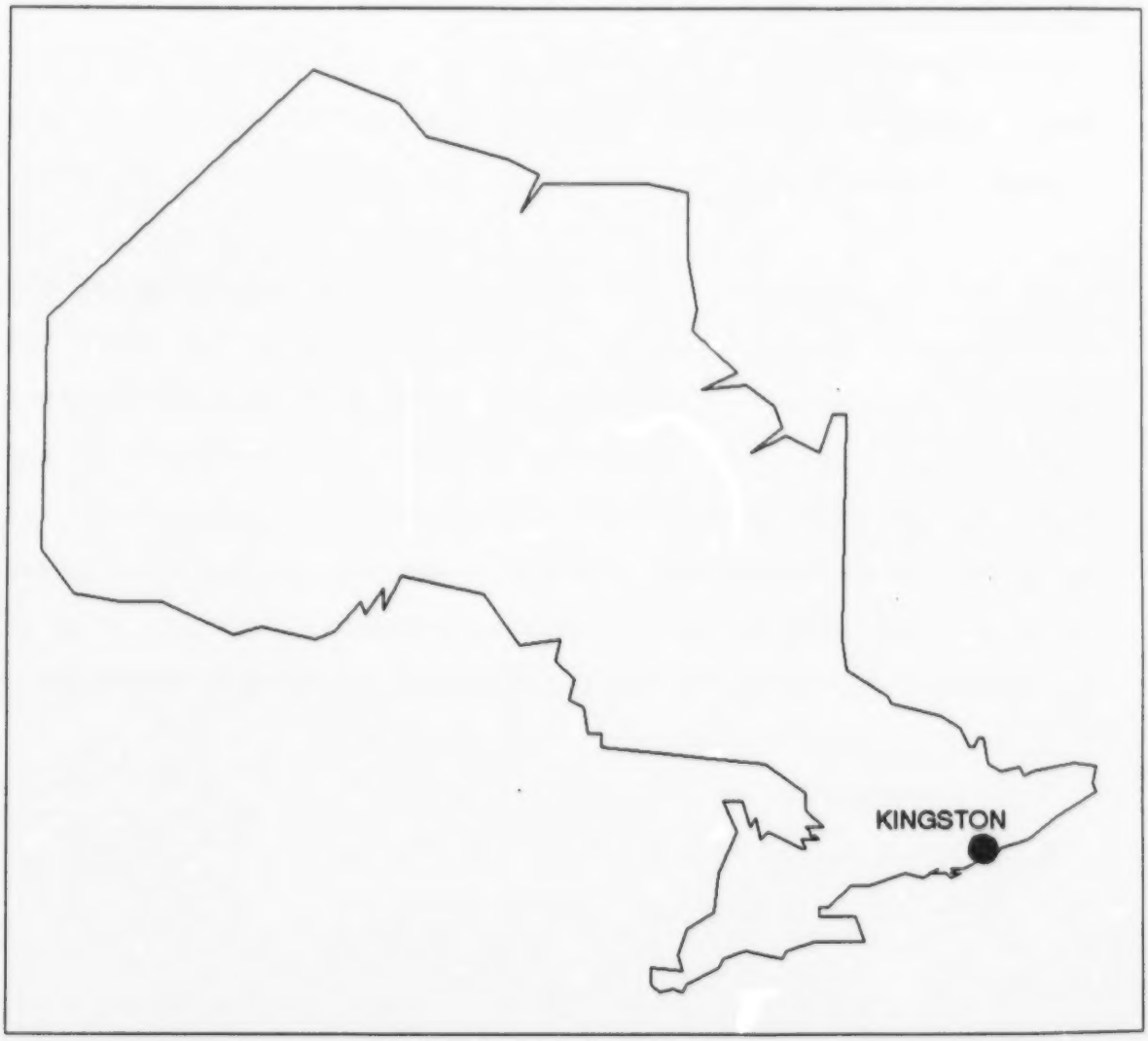

FIGURE 2

KINGSTON WTP

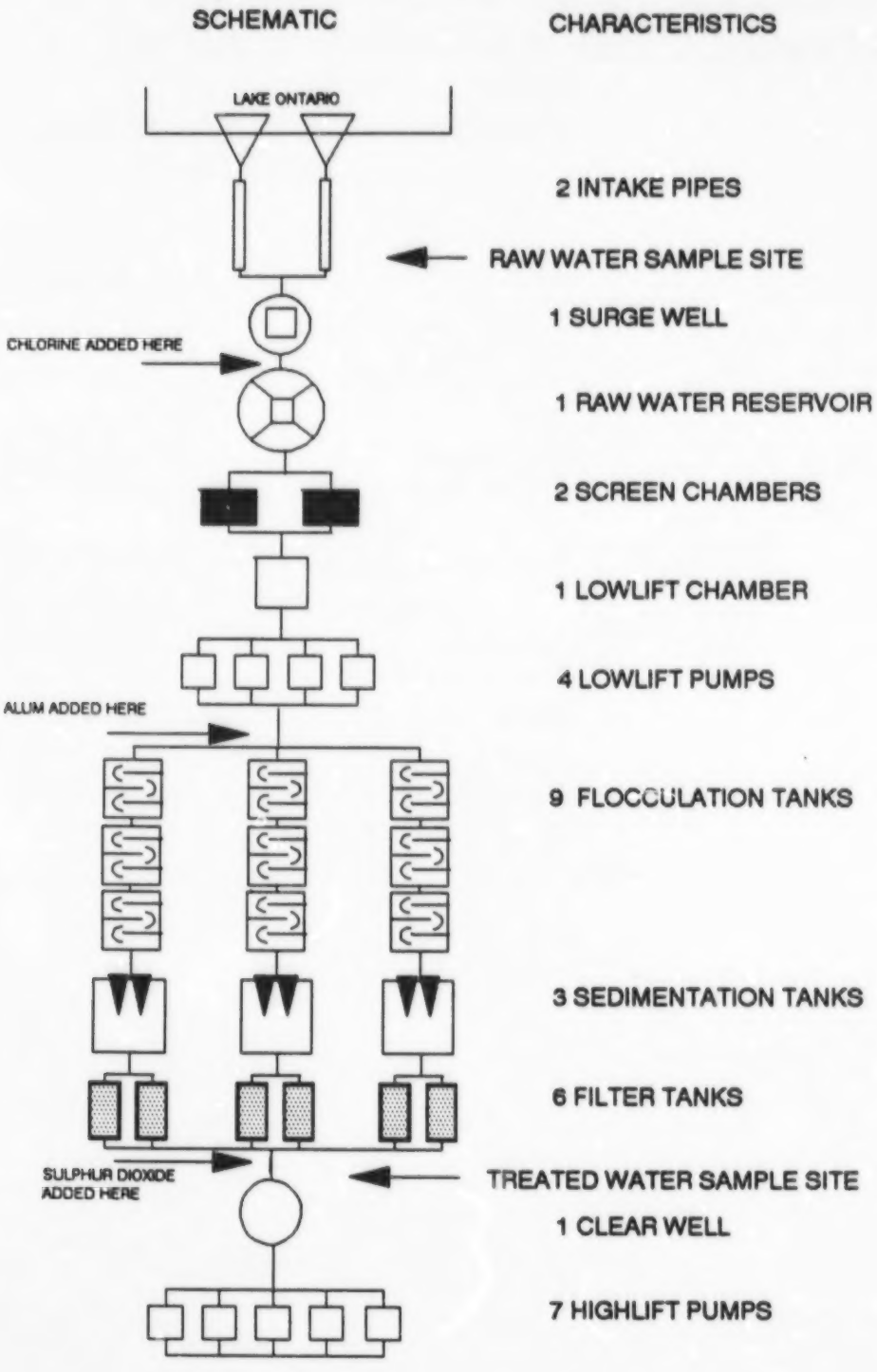

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

IN-PLANT MONITORING KINGSTON WATER SUPPLY SYSTEM 1989

PARAMETER	LOCATION	FREQUENCY
Aluminum residual	Final water	daily
Chlorine residuals		
(free)	Bottom of filter	continuous
(combined)	Final water	continuous
(total)	Plant effluent	continuous
pH	Raw water	daily
	Final water	daily
Temperature	Raw water intake	continuous
Turbidity	Lowlifts	continuous
	Plant effluent	continuous

TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

KINGSTON WATER SUPPLY SYSTEM

LOCATION:	302 KING STREET WEST KINGSTON, ONTARIO K7L 2X1 (613-542-1763)
SOURCE:	RAW WATER SOURCE - LAKE ONTARIO
DESIGN CAPACITY:	94.4 (1000 M^3/DAY)
OPERATION:	MUNICIPALITY
PLANT SUPERINTENDENT:	K. ALLEN
MINISTRY REGION:	SOUTHEAST
DISTRICT OFFICER:	MR. J. BISHOP

MUNICIPALITY SERVED	POPULATION
KINGSTON	81,000

RESULTS

Field chemistry measurements were recorded on the day of sampling and were entered onto the DWSP data base as submitted by plant personnel.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed by parameter and by water type. The number of times that a positive or trace result was detected is also reported.
Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment (MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analysed in DWSP.

Associated guidelines and detection limits are also supplied on

tables 5 and 6. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters. These are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS) recently published (ISBN 0-7729-4461-X) by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

Many of the compounds detected are naturally occuring or are treatment by-products.

IN THIS REPORT, DISCUSSION IS LIMITED TO THE TREATED AND DISTRIBUTED WATER AND ADDRESSES ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES AND ORGANICS WITH POSITIVE RESULTS.

Results of the raw and treated water indicate that no applicable health related guidelines were exceeded.

Bacteriology

Standard Plate Count

The ODWO for Standard Plate Count of 500 counts/mL (indicating some deterioration) was exceeded, twice in the Site 1 water, in August and September.

Inorganic and Physical Parameters

Aluminum

The plant operational guideline of 100 µg/L as Al in the treated water leaving the plant was exceeded twice in the treated water.

Organic Parameters

Trihalomethanes

Trihalomethanes (THMs) are acknowledged to be produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of Chloroform, Chlorodibromomethane and Dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. All total THM occurrences, ranging from 16.6 to 37.7 µg/L, were well below the ODWO of 350 µg/L.

Comparison with the results from the DWSP in 1986, 1987 and 1988 shows that the raw and treated water quality has remained consistent.

CONCLUSIONS

The Kingston Water Treatment Plant for the sample year of 1989 produced good quality water at the plant and this was maintained in the distribution system.

No health related guidelines, for organic or inorganic parameters, were exceeded during the sampling period from 1986 to 1989.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP SAMPLE DAY CONDITIONS FOR 1989

SAMPLE DAY CONDITIONS			TREATMENT CHEMICAL DOSAGES (MG/L)		
			PRE-CHLORINATION	COAGULATION	DECHLORINATION
			CHLORINE	ALUM LIQUID	SULPHUR DIOXIDE
DATE	DELAY * TIME(HRS)	FLOW (1000M3)			
JAN 04	6.7	53.5	1.10	7.40	.03
FEB 07	6.3	55.0	1.10	9.30	.17
MAR 07	6.5	55.0	1.20	7.60	.19
APR 04	7.3	50.0	1.70	9.20	.05
MAY 02	7.2	51.0	1.40	5.70	.19
JUN 06	6.1	62.0	1.60	9.10	.28
JUL 11	5.4	65.0	1.70	8.20	.11
AUG 09	2.4	67.0	1.70	7.90	.04
SEP 06	5.5	65.7	1.70	8.00	.08
OCT 03	5.4	67.0	1.40	5.60	.24
NOV 07	5.5	62.5	1.40	6.00	.05
DEC 05	6.5	55.0	1.30	7.00	.16

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

		RAW			TREATED			SITE 1			SITE 2		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
BACTERIOLOGICAL	FECAL COLIFORM MF	12	4	0	.	.	.	.	.	.	.	.	.
	STAMDRD PLATE CNT MF	.	.	.	12	0	0	8	5	0	12	5	0
	TOTAL COLIFORM MF	12	9	0	12	0	0	8	0	0	12	0	0
	T COLIFORM BCKGRD MF	12	12	0	12	2	0	8	1	0	12	2	0
*TOTAL SCAN BACTERIOLOGICAL		36	25	0	36	2	0	24	6	0	36	7	0
*TOTAL GROUP BACTERIOLOGICAL		36	25	0	36	2	0	24	6	0	36	7	0
CHEMISTRY (FLD)	FLD CHLORINE (COMB)	.	.	.	12	12	0	14	14	0	24	24	0
	FLD CHLORINE FREE	.	.	.	12	12	0	12	11	0	17	7	0
	FLD CHLORINE (TOTAL)	.	.	.	12	12	0	14	14	0	24	24	0
	FLD PH	12	12	0	12	12	0	14	14	0	24	24	0
	FLD TEMPERATURE	11	11	0	12	12	0	14	14	0	24	24	0
	FLD TURBIDITY	11	11	0	12	12	0	2	2	0	7	7	0
*TOTAL SCAN CHEMISTRY (FLD)		34	34	0	72	72	0	70	69	0	120	110	0
CHEMISTRY (LAB)	ALKALINITY	12	12	0	12	12	0	16	16	0	24	24	0
	CALCIUM	12	12	0	12	12	0	16	16	0	24	24	0
	CYANIDE	12	0	0	12	0	0	8	0	0	12	0	0
	CHLORIDE	12	12	0	12	12	0	16	16	0	24	24	0
	COLOUR	12	5	7	12	0	12	16	16	0	24	1	23
	CONDUCTIVITY	12	12	0	12	12	0	16	16	0	24	24	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	SITE RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE	SITE 2 TOTAL	SITE 2 POSITIVE	SITE 2 TRACE
CHEMISTRY (LAB)	FLUORIDE	12	12	0	12	12	0	16	16	0	24	24	0
	HARDNESS	12	12	0	12	12	0	16	16	0	24	24	0
	IONCAL	12	12	0	12	12	0	16	16	0	24	24	0
	LANGELIERS INDEX	12	12	0	12	12	0	16	16	0	23	23	0
	MAGNESIUM	12	12	0	12	12	0	16	16	0	24	24	0
	SODIUM	12	12	0	12	12	0	16	16	0	24	24	0
	AMMONIUM TOTAL	12	5	3	12	2	6	16	2	10	24	3	11
	NITRITE	12	1	10	12	0	9	16	0	16	24	0	20
	TOTAL NITRATES	12	12	0	12	12	0	16	16	0	24	24	0
	NITROGEN TOT KJELD	12	12	0	12	12	0	16	16	0	24	24	0
	PH	12	12	0	12	12	0	16	16	0	24	24	0
	PHOSPHORUS FIL REACT	12	1	6	12	0	2	.	.	.	.	.	.
	PHOSPHORUS TOTAL	12	8	4	12	0	8	.	.	.	.	.	.
	SULPHATE	12	12	0	12	12	0	16	16	0	24	24	0
	TURBIDITY	12	12	0	12	10	2	16	15	1	24	20	4
*TOTAL SCAN CHEMISTRY (LAB)		252	200	30	252	180	39	296	257	27	443	359	58
METALS	SILVER	12	0	3	12	0	3	16	0	4	24	0	2
	ALUMINUM	12	12	0	12	12	0	16	16	0	24	24	0
	ARSENIC	12	6	6	12	3	9	16	4	12	24	6	18
	BARIUM	12	12	0	12	12	0	16	16	0	24	24	0
	BORON	12	12	0	12	12	0	16	16	0	24	24	0
	BERYLLIUM	12	0	8	12	0	9	16	0	14	24	0	17

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

		SITE											
		RAW			TREATED			SITE 1			SITE 2		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS	CADMIUM	12	0	3	12	0	4	16	0	5	24	0	9
	COBALT	12	0	11	12	0	12	16	0	15	24	0	23
	CHROMIUM	12	5	7	12	10	2	16	12	4	24	20	4
	COPPER	12	12	0	12	11	1	16	16	0	24	24	0
	IRON	12	0	10	12	0	3	16	14	2	24	3	21
	MERCURY	12	0	2	12	0	2	8	0	0	12	0	1
	MANGANESE	12	12	0	12	3	9	16	16	0	24	24	0
	MOLYBDENUM	12	12	0	12	12	0	16	16	0	24	24	0
	NICKEL	12	0	10	12	0	10	16	0	12	24	0	21
	LEAD	12	6	6	12	2	8	16	15	1	24	18	6
	ANTIMONY	12	12	0	12	12	0	16	16	0	24	24	0
	SELENIUM	12	0	9	12	1	9	16	0	16	24	0	19
	STRONTIUM	12	12	0	12	12	0	16	16	0	24	24	0
	TITANIUM	12	12	0	12	12	0	16	14	2	24	22	2
	THALLIUM	12	0	7	12	0	4	16	0	9	24	0	13
	URANIUM	12	11	1	12	12	0	16	15	1	24	24	0
	VANADIUM	12	0	12	12	8	4	16	0	15	24	9	15
	ZINC	12	12	0	12	9	3	16	16	0	24	24	0
*TOTAL SCAN METALS		288	148	95	288	143	92	376	218	112	564	318	171
*TOTAL GROUP INORGANIC & PHYSICAL		574	382	125	612	395	131	742	544	139	1127	787	229
CHLOROAROMATICS	HEXACHLOROBUTADIENE	11	0	0	11	0	0	7	0	0	11	0	0
	123 TRICHLOROBENZENE	11	0	0	11	0	0	7	0	0	11	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

		SITE											
		RAW			TREATED			SITE 1			SITE 2		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHLOROAROMATICS	1234 T-CHLOROBENZENE	11	0	0	11	0	0	7	0	0	11	0	0
	1235 T-CHLOROBENZENE	11	0	0	11	0	0	7	0	0	11	0	0
	124 TRICHLOROBENZENE	11	0	0	11	0	0	7	0	0	11	0	0
	1245 T-CHLOROBENZENE	11	0	0	11	0	0	7	0	0	11	0	0
	135 TRICHLOROBENZENE	11	0	0	11	0	0	7	0	0	11	0	0
	HCB	11	0	0	11	0	0	7	0	0	11	0	0
	HEXACHLOROETHANE	11	0	0	11	0	0	7	0	0	11	0	0
	OCTACHLOROSTYRENE	11	0	0	11	0	0	7	0	0	11	0	0
	PENTACHLOROBENZENE	11	0	0	11	0	0	7	0	0	11	0	0
	236 TRICHLOROTOLUENE	11	0	0	11	0	0	7	0	0	11	0	0
	245 TRICHLOROTOLUENE	11	0	0	11	0	0	7	0	0	11	0	0
	26A TRICHLOROTOLUENE	11	0	0	11	0	0	7	0	0	11	0	0
*TOTAL SCAN CHLOROAROMATICS		154	0	0	154	0	0	98	0	0	154	0	0
CHLOROPHENOLS	234 TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
	2345 T-CHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
	2356 T-CHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
	245-TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
	246-TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
	PENTACHLOROPHENOL	2	0	0	2	0	0	.	.	.	.	.	.
*TOTAL SCAN CHLOROPHENOLS		12	0	0	12	0	0	0	0	0	0	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

		SITE											
		RAW			TREATED			SITE 1			SITE 2		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PAH	PHENANTHRENE	11	0	0	12	0	0	.	.	.	.	.	.
	ANTHRACENE	11	0	0	12	0	0	.	.	.	.	.	.
	FLUORANTHENE	11	0	0	12	0	0	.	.	.	.	.	.
	PYRENE	11	0	0	12	0	0	.	.	.	.	.	.
	BENZO(A)ANTHRACENE	11	0	0	12	0	0	.	.	.	.	.	.
	CHRYSENE	11	0	0	12	0	0	.	.	.	.	.	.
	DIMETH. BENZ(A)ANTHR	4	0	0	4	0	0	.	.	.	.	.	.
	BENZO(E) PYRENE	11	0	0	12	0	0	.	.	.	.	.	.
	BENZO(B) FLUORANTHEN	11	0	0	12	0	0	.	.	.	.	.	.
	PERYLENE	11	0	0	12	0	0	.	.	.	.	.	.
	BENZO(K) FLUORANTHEN	11	0	0	12	0	0	.	.	.	.	.	.
	BENZO(A) PYRENE	5	0	0	5	0	0	.	.	.	.	.	.
	BENZO(G,H,I) PERYLEN	11	0	0	12	0	0	.	.	.	.	.	.
	DIBENZO(A,H) ANTHRAC	11	0	0	12	0	0	.	.	.	.	.	.
	INDENO(1,2,3-C,D) PY	11	0	0	12	0	0	.	.	.	.	.	.
	BENZO(B) CHRYSENE	11	0	0	12	0	0	.	.	.	.	.	.
	CORONENE	11	0	0	12	0	0	.	.	.	.	.	.
*TOTAL SCAN PAH		174	0	0	189	0	0	0	0	0	0	0	0
PESTICIDES & PCB	ALDRIN	11	0	0	11	0	0	7	0	0	11	0	0
	ALPHA BHC	11	0	3	11	0	6	7	0	4	11	0	5
	BETA BHC	11	0	0	11	0	0	7	0	0	11	0	0
	LINDANE	11	0	2	11	0	0	7	0	0	11	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	SITE RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE	SITE 2 TOTAL	SITE 2 POSITIVE	SITE 2 TRACE
PESTICIDES & PCB	ALPHA CHLORDANE	11	0	0	11	0	0	7	0	0	11	0	0
	GAMMA CHLORDANE	11	0	0	11	0	0	7	0	0	11	0	0
	DIELDRIN	11	0	0	11	0	0	7	0	0	11	0	0
	METHOXYCHLOR	11	0	0	11	0	0	7	0	0	11	0	0
	ENDOSULFAN I	11	0	0	11	0	0	7	0	0	11	0	0
	ENDOSULFAN II	11	0	0	11	0	0	7	0	0	11	0	0
	ENDRIN	11	0	0	11	0	0	7	0	0	11	0	0
	ENDOSULFAN SULPHATE	11	0	0	11	0	0	7	0	0	11	0	0
	HEPTACHLOR EPOXIDE	11	0	0	11	0	0	7	0	0	11	0	0
	HEPTACHLOR	11	0	0	11	0	0	7	0	0	11	0	0
	MIREX	11	0	0	11	0	0	7	0	0	11	0	0
	OXYCHLORDANE	11	0	0	11	0	0	7	0	0	11	0	0
	OPDDT	11	0	0	11	0	0	7	0	0	11	0	0
	PCB	11	0	0	11	0	0	7	0	0	11	0	0
	DDD	11	0	0	11	0	0	7	0	0	11	0	0
	PPDDE	11	0	0	11	0	0	7	0	0	11	0	0
	PPDDT	11	0	0	11	0	0	7	0	0	11	0	0
	AMETRINE	12	0	0	12	0	0	6	0	0	7	0	0
	ATRAZINE	12	0	0	12	0	0	6	0	0	7	0	0
	ATRATONE	12	0	0	12	0	0	6	0	0	7	0	0
	CYANAZINE (BLADEX)	12	0	0	12	0	0	6	0	0	7	0	0
	D-ETHYL ATRAZINE	12	0	0	12	0	0	6	0	0	7	0	0
	D-ETHYL SIMAZINE	12	0	0	12	0	0	6	0	0	7	0	0
	PROMETONE	12	0	0	12	0	0	6	0	0	7	0	0
	PROPAZINE	12	0	0	12	0	0	6	0	0	7	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

		SITE											
		RAW			TREATED			SITE 1			SITE 2		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	PROMETRYNE	12	0	0	12	0	0	6	0	0	7	0	0
	METRIBUZIN (SENCOR)	12	0	0	12	0	0	6	0	0	7	0	0
	SIMAZINE	12	0	0	12	0	0	6	0	0	7	0	0
	ALACHLOR (LASSO)	12	0	0	12	0	0	6	0	0	7	0	0
	METOLACHLOR	12	0	0	12	0	0	6	0	0	7	0	0
*TOTAL SCAN PESTICIDES & PCB		387	0	5	387	0	6	225	0	4	322	0	5
PHENOLICS	PHENOLICS	12	9	3	11	8	3	-	-	-	-	-	-
*TOTAL SCAN PHENOLICS		12	9	3	11	8	3	0	0	0	0	0	0
SPECIFIC PESTICIDES	TOXAPHENE	10	0	0	10	0	0	6	0	0	10	0	0
	2,4,5-T	2	0	0	2	0	0	-	-	-	-	-	-
	2,4-D	2	0	0	2	0	0	-	-	-	-	-	-
	2,4-DB	2	0	0	2	0	0	-	-	-	-	-	-
	2,4 D PROPIONIC ACID	2	0	0	2	0	0	-	-	-	-	-	-
	DICAMBA	2	0	0	2	0	0	-	-	-	-	-	-
	PICHLORAM	0	0	0	0	0	0	-	-	-	-	-	-
	SILVEX	2	0	0	2	0	0	-	-	-	-	-	-
	DIAZINON	2	0	0	2	0	0	-	-	-	-	-	-
	DICHLORVOS	2	0	0	2	0	0	-	-	-	-	-	-
	CHLORPYRIFOS	2	0	0	2	0	0	-	-	-	-	-	-

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	SITE RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE	SITE 2 TOTAL	SITE 2 POSITIVE	SITE 2 TRACE
SPECIFIC PESTICIDES	ETHION	2	0	0	2	0	0	.	.	.	.	.	.
	AZINPHOS-METHYL	0	0	0	0	0	0	.	.	.	.	.	.
	MALATHION	2	0	0	2	0	0	.	.	.	.	.	.
	MEVINPHOS	2	0	0	2	0	0	.	.	.	.	.	.
	METHYL PARATHION	2	0	0	2	0	0	.	.	.	.	.	.
	METHYLTRITHION	2	0	0	2	0	0	.	.	.	.	.	.
	PARATHION	2	0	0	2	0	0	.	.	.	.	.	.
	PHORATE	2	0	0	2	0	0	.	.	.	.	.	.
	RELDAN	2	0	0	2	0	0	.	.	.	.	.	.
	RONNEL	2	0	0	2	0	0	.	.	.	.	.	.
	AMINOCARB	1	0	0	1	0	0	.	.	.	.	.	.
	BENOMYL	1	0	0	1	0	0	.	.	.	.	.	.
	BUX	0	0	0	0	0	0	.	.	.	.	.	.
	CARBOFURAN	2	0	0	2	0	0	.	.	.	.	.	.
	CICP	2	0	0	2	0	0	.	.	.	.	.	.
	DIALLATE	2	0	0	2	0	0	.	.	.	.	.	.
	EPTAM	1	0	0	1	0	0	.	.	.	.	.	.
	IPC	2	0	0	2	0	0	.	.	.	.	.	.
	PROPOXUR	2	0	0	2	0	0	.	.	.	.	.	.
	CARBARYL	2	0	0	2	0	0	.	.	.	.	.	.
	BUTYLATE	2	0	0	2	0	0	.	.	.	.	.	.
*TOTAL SCAN SPECIFIC PESTICIDES		63	0	0	63	0	0	6	0	0	10	0	0
VOLATILES	BENZENE	11	0	1	12	0	0	8	0	1	12	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	SITE RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE	SITE 2 TOTAL	SITE 2 POSITIVE	SITE 2 TRACE
VOLATILES	TOLUENE	11	0	3	12	0	4	8	0	1	12	0	3
	ETHYLBENZENE	11	0	2	12	0	2	8	0	0	12	0	0
	P-XYLENE	11	0	0	12	0	0	8	0	0	12	0	0
	M-XYLENE	11	0	0	12	0	1	8	0	0	12	0	0
	O-XYLENE	11	0	1	12	0	2	8	0	0	12	0	0
	STYRENE	11	0	9	12	0	9	8	0	7	12	0	12
	1,1 DICHLOROETHYLENE	11	0	0	12	0	0	8	0	0	12	0	0
	METHYLENE CHLORIDE	11	0	0	12	0	0	8	0	0	12	0	0
	T1,2DICHLOROETHYLENE	11	0	0	12	0	0	8	0	0	12	0	0
	1,1 DICHLOROETHANE	11	0	0	12	0	0	8	0	0	12	0	0
	CHLOROFORM	11	0	2	12	12	0	8	8	0	12	12	0
	111, TRICHLOROETHANE	11	0	3	12	0	1	8	0	1	12	0	1
	1,2 DICHLOROETHANE	11	0	0	12	0	0	8	0	0	12	0	0
	CARBON TETRACHLORIDE	11	0	0	12	0	0	8	0	0	12	0	0
	1,2 DICHLOROPROPANE	11	0	0	12	0	0	8	0	0	12	0	0
	TRICHLOROETHYLENE	11	0	0	12	0	0	8	0	0	12	0	0
	DICHLOROBROMOMETHANE	11	0	1	12	12	0	8	8	0	12	12	0
	112 TRICHLOROETHANE	11	0	0	12	0	0	8	0	0	12	0	0
	CHLORODIBROMOMETHANE	11	0	0	12	12	0	8	8	0	12	12	0
	T-CHLOROETHYLENE	11	0	0	12	0	0	8	0	0	12	0	0
	BROMOFORM	11	0	0	12	0	12	8	0	8	12	0	11
	1122 T-CHLOROETHANE	11	0	0	12	0	0	8	0	0	12	0	0
	CHLOROBENZENE	11	0	0	12	0	0	8	0	0	12	0	0
	1,4 DICHLOROBENZENE	11	0	0	12	0	2	8	0	0	12	0	0
	1,3 DICHLOROBENZENE	11	0	0	12	0	0	8	0	0	12	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON

SUMMARY TABLE OF RESULTS (1989)

SCAN	PARAMETER	SITE RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE	SITE 2 TOTAL	SITE 2 POSITIVE	SITE 2 TRACE
VOLATILES	1,2 DICHLOROBENZENE	11	0	0	12	0	0	8	0	0	12	0	0
	ETHLYENE DIBROMIDE	11	0	0	12	0	0	8	0	0	12	0	0
	TOTL TRIHALOMETHANES	11	0	1	12	12	0	8	8	0	12	12	0
*TOTAL SCAN VOLATILES		319	0	23	348	48	33	232	32	18	348	48	27
*TOTAL GROUP ORGANIC		1121	9	31	1164	56	42	561	32	22	834	48	32
TOTAL		1731	416	156	1812	453	173	1327	582	161	1997	842	261

KEY TO TABLE 5 and 6

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
1*. MAC for Bacteriological Analyses
Poor water quality is indicated when :
- total coliform counts > 0 < 5
- P/A Bottle Test is present after 48 hours
- Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
- Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
- Standard Plate Count should not exceed 500 organisms per ml at 35 ^{0}C within 48 hours

2. Interim Maximum Acceptable Concentration (IMAC)
3. Maximum Desirable Concentration (MDC)
4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness >200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.

B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO) (for xylenes, a total)

C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria
5. Maximum Contaminant Level Goal (MCLG)

F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

H USSR MAXIMUM PERMISSIBLE CONCENTRATION

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

INTERPRETATION OF DATA

The interpretation of analytical results that are obtained from measurements near the limit of detection of the measurement process is subject to greater uncertainty than those at higher concentrations. The principle areas of concern relate to whether the substance has actually been detected, whether it has been properly identified, and whether it is an artifact of the measurement process. In other words, false positives can be caused by the instrumentation or the test procedures used, when in fact these compounds are not present in the sample.

There are several methods to treat data from such measurements:
1. Exclude the low-level data because of this uncertainty factor. However, studies of long-term environmental trends and modelling may be adversely affected by exclusion of such data.
2. Qualify these data so the user is aware of the greater uncertainty associated with their use.

For the Drinking Water Surveillance Program, measurements near the limit of detection of the measurement process are reported qualified by the code "<T". Results quantified by "W" indicate a zero measurement. These results are reported for purposes of modelling and long-term trend analysis and no significance should be attributed to a single determination of a substance below "T" (a single determination may well be a false positive). Repeat analysis or additional data are needed before it can be stated with certainty that the substance in question was truly present. On the other hand, it is less likely that repeated detection of a substance at or near the limit of detection at a specific location is solely due to an artifact in the measurement system, and more likely represents a true positive. However the average of such data is still only an estimate of the amount of substance present subject to the possible biases of the method used.

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IP	No Data: Insufficient Preservative
!IS	No Data: Insufficient Sample

!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours
T# (T06)	Result Taken After # Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
BACTERIOLOGICAL						
FECAL COLIFORM MF (CT/100ML)			**DET'N LIMIT = 0**		**GUIDELINE = 0 (A1)**	
JAN	0 T24	.	.	.	.	.
FEB	0 T24	.	.	.	.	.
MAR	0 T24	.	.	.	.	.
APR	0 T48	.	.	.	.	.
MAY	0	.	.	.	.	.
JUN	2	.	.	.	.	.
JUL	1	.	.	.	.	.
AUG	45 A3C	.	.	.	.	.
SEP	BDL	.	.	.	.	.
OCT	BDL	.	.	.	.	.
NOV	6	.	.	.	.	.
DEC	0	.	.	.	.	.
STANDRD PLATE CNT MF ( )			**DET'N LIMIT =**		**GUIDELINE =**	
JAN	.	3 <=>	.	0 <=>	.	0 <=>
FEB	.	0 <=>	.	0 <=>	.	0 <=>
MAR	.	3 <=>	.	2 <=>	.	4 <=>
APR	.	1 <=>	.	108 T24	.	304 T24
MAY	.	0 <=>	.	71	.	2 <=>
JUN	.	1 <=>	.	89	.	12
JUL	.	0 <=>	.	.	.	11
AUG	.	0 <=>	.	770	.	54
SEP	.	0 <=>	.	680	.	70
OCT	.	1 <=>	.	.	.	1 <=>
NOV	.	5 <=>	.	.	.	8 <=>
DEC	.	0 <=>	.	.	.	0 <=>
TOTAL COLIFORM MF (CT/100ML)			**DET'N LIMIT = 0**		**GUIDELINE = 5/100ML(A1)**	
JAN	4 T24	0 T24	.	0 T24	.	0 T24
FEB	76 A3C	0 T24	.	0 T24	.	0 T24
MAR	BDL	0 T24	.	0 T24	.	0 T24
APR	7 T48	0 T48	.	0 T24	.	0 T24
MAY	1	0	.	0	.	0
JUN	16	0	.	0	.	0
JUL	4 A3C	0	.	.	.	0
AUG	730 A3C	0	.	0	.	0
SEP	50 <=>	0	.	0	.	0
OCT	100	0	.	.	.	0
NOV	52 A3C	0	.	.	.	0
DEC	BDL	0	.	.	.	0
T COLIFORM BCKGRD MF (CT/100ML)			**DET'N LIMIT = 0**		**GUIDELINE = N/A**	
JAN	5 T24	0 T24	.	0 T24	.	0 T24
FEB	1900 A3C	0 T24	.	0 T24	.	0 T24
MAR	4 T24	0 T24	.	0 T24	.	0 T24

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
APR	150 T48	0 T48	.	0 T24	.	0 T24
MAY	11	0	.	0	.	0
JUN	2400 >	20	.	0	.	0
JUL	1160 A3C	0	.	.	.	0
AUG	24000 >	0	.	1	.	1
SEP	1950	0	.	0	.	2
OCT	1010	2	.	.	.	0
NOV	560 A3C	0	.	.	.	0
DEC	24	0	.	.	.	0

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
CHEMISTRY (FLD)						
FLD CHLORINE (COMB) ( )			**DET'N LIMIT =**		**GUIDELINE =**	
JAN	.	.150	.150	.150	.100	.100
FEB	.	.130	.100	.100	.100	.100
MAR	.	.180	.	.	.100	.100
APR	.	.180	.100	.100	.100	.100
MAY	.	.160	.100	.100	.100	.100
JUN	.	.150	.100	.130	.100	.100
JUL	.	.170	.	.	.100	.100
AUG	.	.170	.100	.150	.100	.100
SEP	.	.180	.100	.100	.100	.100
OCT	.	.120	.	.	.100	.100
NOV	.	.170	.	.	.100	.100
DEC	.	.160	.	.	.100	.100
FLD CHLORINE FREE ( )			**DET'N LIMIT =**		**GUIDELINE =**	
JAN	.	.340	.	.	.	.
FEB	.	.400	.100	.100	.	.
MAR	.	.320	.	.	.	.100
APR	.	.220	.100	.100	.	.100
MAY	.	.310	.100	.100	.	.100
JUN	.	.290	.100	.100	.000	.100
JUL	.	.370	.	.	.000	.100
AUG	.	.320	.000	.100	.000	.100
SEP	.	.320	.100	.100	.000	.000
OCT	.	.380	.	.	.000	.000
NOV	.	.410	.	.	.000	.100
DEC	.	.340	.	.	.000	.000
FLD CHLORINE (TOTAL) ( )			**DET'N LIMIT =**		**GUIDELINE =**	
JAN	.	.490	.150	.120	.100	.100
FEB	.	.530	.200	.200	.100	.100
MAR	.	.500	.	.	.100	.200
APR	.	.400	.200	.200	.100	.200
MAY	.	.470	.200	.200	.100	.200
JUN	.	.440	.200	.230	.100	.200
JUL	.	.540	.	.	.100	.200
AUG	.	.490	.100	.250	.100	.200
SEP	.	.500	.200	.200	.100	.100
OCT	.	.400	.	.	.100	.100
NOV	.	.580	.	.	.100	.200
DEC	.	.500	.	.	.100	.100
FLD PH (DMNSLESS)			**DET'N LIMIT = N/A**		**GUIDELINE = 6.5-8.5(A4)**	
JAN	8.200	8.000	7.800	7.600	7.600	7.600
FEB	8.200	7.700	7.800	7.600	7.800	7.600
MAR	8.300	7.900	.	.	7.800	7.600

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
APR	8.300	8.000	7.600	7.600	7.600	7.600
MAY	7.900	7.600	7.600	7.600	7.600	7.600
JUN	8.300	7.900	7.600	7.600	7.600	7.600
JUL	8.100	7.900	.	.	7.600	7.600
AUG	7.900	7.700	7.600	7.600	7.600	7.600
SEP	8.400	7.900	7.600	7.600	7.600	7.600
OCT	8.400	8.100	.	.	7.800	7.800
NOV	8.500	8.100	.	.	7.600	7.600
DEC	8.700	8.300	.	.	7.800	7.600
FLD TEMPERATURE (DEG.C)			DET'N LIMIT = N/A		GUIDELINE = 15 (A1)	
JAN	1.300	1.400	10.000	8.000	10.000	6.000
FEB	.100	3.000	10.000	5.500	9.500	5.000
MAR	.200	4.000	.	.	8.500	4.000
APR	.600	.800	9.000	5.000	10.000	5.000
MAY	4.000	4.200	10.000	7.000	11.000	7.000
JUN	9.000	9.200	14.000	12.000	14.000	11.000
JUL	9.000	10.000	.	.	18.000	14.000
AUG	13.000	16.500	17.000	15.000	18.000	16.000
SEP	19.500	21.000	19.500	18.500	19.000	18.500
OCT	15.000	16.000	.	.	18.000	17.000
NOV	.	11.500	.	.	14.000	13.000
DEC	4.000	7.000	.	.	11.000	9.000
FLD TURBIDITY (FTU)			DET'N LIMIT = N/A		GUIDELINE = 1.0 (A1)	
JAN	.600	.070	.090	.080	.090	.070
FEB	.600	.300	.	.	.	.
MAR	.650	.060	.	.	.	.
APR	.850	.100	.	.	.	.
MAY	.	.100	.	.	.	.
JUN	.700	.090	.	.	.	.
JUL	.650	.080	.	.	.090	.070
AUG	1.000	.180	.	.	.	.
SEP	.700	.060	.	.	.	.
OCT	.650	.060	.	.	.	.
NOV	1.000	.090	.	.	.090	.070
DEC	.900	.060	.	.	.090	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
CHEMISTRY (LAB)						
ALKALINITY (MG/L)			DET'N LIMIT = .200		GUIDELINE = 30-500 (A4)	
JAN	100.900	94.800	94.700	95.000	95.100	95.700
FEB	102.700	96.200	96.900	96.500	96.000	97.700
MAR	104.000	98.500	98.600	98.200	96.700	96.700
APR	100.300	93.800	93.900	92.900	93.600	93.600
MAY	101.700	96.000	96.200	95.800	95.800	96.000
JUN	100.900	94.000	95.300	94.700	95.200	95.200
JUL	103.100	96.800	.	.	96.800	97.000
AUG	106.100	99.200	98.500	94.200	99.000	99.100
SEP	95.600	89.700	90.000	89.400	90.100	91.200
OCT	97.500	93.500	.	.	93.600	93.400
NOV	100.200	94.200	.	.	95.600	95.400
DEC	102.500	96.400	.	.	96.900	96.800
CALCIUM (MG/L)			DET'N LIMIT = .100		GUIDELINE = 100 (F2)	
JAN	40.400	40.400	34.800	35.000	36.200	34.800
FEB	40.000	39.600	39.800	39.000	37.000	37.800
MAR	40.800	40.600	40.600	41.000	40.400	40.600
APR	41.000	41.800	42.200	41.200	42.000	41.200
MAY	39.400	39.000	41.400	38.600	40.000	40.600
JUN	41.600	41.200	42.300	41.000	42.200	42.000
JUL	42.800	41.800	.	.	41.000	40.400
AUG	40.200	39.600	40.400	39.800	40.400	39.200
SEP	36.800	36.200	37.200	35.000	36.400	36.800
OCT	39.400	38.800	.	.	39.400	39.400
NOV	39.600	38.800	.	.	39.800	39.800
DEC	43.000	43.200	.	.	43.400	42.800
CHLORIDE (MG/L)			DET'N LIMIT = .200		GUIDELINE = 250 (A3)	
JAN	23.200	23.100	24.000	24.000	24.000	23.900
FEB	22.700	23.400	23.400	23.300	23.900	23.600
MAR	22.700	24.000	24.200	24.200	24.000	23.900
APR	22.600	23.800	23.300	23.300	23.600	23.500
MAY	21.600	23.000	23.700	23.000	23.300	23.400
JUN	21.600	22.900	22.900	22.700	23.000	22.900
JUL	20.600	22.100	.	.	22.200	22.300
AUG	21.400	22.900	23.000	22.900	23.000	22.900
SEP	21.500	23.000	23.300	23.100	23.500	23.400
OCT	22.300	23.300	.	.	23.500	23.000
NOV	22.100	23.600	.	.	23.300	23.000
DEC	21.900	22.900	.	.	23.000	22.900
COLOUR (HZU)			DET'N LIMIT = .5		GUIDELINE = 5.0 (A3)	
JAN	2.000 <T	1.000 <T	4.500	5.000	1.500 <T	1.500 <T
FEB	2.000 <T	.500 <T	3.500	4.000	1.000 <T	1.500 <T
MAR	2.000 <T	1.000 <T	3.500	4.000	2.000 <T	1.500 <T

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
APR	2.500	1.000 <T	3.500	3.500	1.500 <T	1.500 <T
MAY	4.000	1.000 <T	3.000	3.500	2.000 <T	1.500 <T
JUN	2.500	1.000 <T	4.500	2.500	1.500 <T	2.000 <T
JUL	4.000	1.500 <T	.	.	2.000 <T	2.000 <T
AUG	2.500	1.500 <T	3.500	3.500	2.000 <T	2.500
SEP	2.000 <T	.500 <T	3.500	3.500	1.500 <T	1.000 <T
OCT	2.000 <T	1.000 <T	.	.	2.000 <T	1.500 <T
NOV	2.000 <T	.500 <T	.	.	1.500 <T	1.000 <T
DEC	1.500 <T	.500 <T	.	.	1.000 <T	1.000 <T
CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1		GUIDELINE = 400 (F2)	
JAN	323	324	324	324	325	327
FEB	324	325	326	325	326	327
MAR	331	335	337	337	329	328
APR	327	329	329	327	328	328
MAY	326	330	331	326	331	332
JUN	320	321	323	321	324	323
JUL	319	323	.	.	323	323
AUG	325	327	325	317	326	326
SEP	308	310	311	308	312	313
OCT	316	321	.	.	321	321
NOV	318	320	.	.	322	322
DEC	327	329	.	.	327	327
FLUORIDE (MG/L)			DET'N LIMIT = .01		GUIDELINE = 2.400 (A1)	
JAN	.160	.120	.120	.120	.120	.100
FEB	.120	.120	.120	.120	.120	.120
MAR	.140	.140	.140	.140	.140	.120
APR	.120	.100	.120	.120	.120	.100
MAY	.100	.120	.140	.160	.140	.140
JUN	.120	.120	.120	.120	.120	.120
JUL	.120	.120	.	.	.100	.120
AUG	.100	.080	.120	.120	.100	.100
SEP	.120	.120	.140	.140	.140	.140
OCT	.120	.120	.	.	.120	.120
NOV	.140	.120	.	.	.120	.120
DEC	.140	.120	.	.	.120	.120
HARDNESS (MG/L)			DET'N LIMIT = .500		GUIDELINE = 80-100 (A4)	
JAN	135.000	134.000	121.000	121.000	125.000	122.000
FEB	133.000	134.000	134.000	132.000	127.000	129.000
MAR	135.000	134.000	134.000	136.000	136.000	137.000
APR	139.000	140.000	142.000	139.000	140.000	139.000
MAY	132.000	131.000	138.000	130.000	134.000	136.000
JUN	137.000	136.000	138.000	137.000	140.000	139.000
JUL	137.000	135.000	.	.	134.000	133.000
AUG	132.000	131.000	135.000	132.000	134.000	131.000

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	126.000	123.000	127.000	121.000	125.000	126.000
OCT	133.000	132.000	.	.	133.000	132.000
NOV	134.000	132.000	.	.	134.000	134.000
DEC	141.600	142.400	.	.	144.000	142.000
IONCAL (DMNSLESS)			DET'N LIMIT = N/A		GUIDELINE = N/A	
JAN	.476	1.480	8.122	7.082	5.654	8.315
FEB	1.453	1.352	2.286	1.730	5.766	4.958
MAR	1.740	3.199	2.864	1.674	.507	.113
APR	4.521	5.099	5.976	4.917	5.128	4.629
MAY	.385	1.450	2.309	2.074	.363	1.438
JUN	2.837	2.314	2.610	2.659	3.849	3.513
JUL	1.890	.970	.	.	.001	.332
AUG	3.591	3.666	1.536	.198	1.873	4.055
SEP	2.442	4.107	2.201	5.247	3.452	4.550
OCT	1.732	.353	.	.	.363	.433
NOV	.476	.505	.	.	.768	.033
DEC	3.161	4.390	.	.	3.241	2.227
LANGELIERS INDEX (DMNSLESS)			DET'N LIMIT = N/A		GUIDELINE = N/A	
JAN	.467	.430	.264	.288	.253	.179
FEB	.360	.257	.162	.152	.137	.073
MAR	.453	.367	.347	.370	.298	.330
APR	.380	.429	.444	.359	.370	.402
MAY	.499	.469	.516	.434	.459	.406
JUN	.440	.325	.422	.446	.300	.328
JUL	.222	.153	.	.	.025	-.020
AUG	.536	.500	.426	.391	.478	.475
SEP	.354	.309	.202	.143	.173	.223
OCT	.472	.426	.	.	.313	.302
NOV	.475	.310	.	.	.307	.426
DEC	.540	.395	.	.	.470	.423
MAGNESIUM (MG/L)			DET'N LIMIT = .050		GUIDELINE = 30 (F2)	
JAN	8.300	8.100	8.300	8.200	8.300	8.500
FEB	8.100	8.400	8.300	8.300	8.400	8.500
MAR	8.100	7.900	8.000	8.100	8.500	8.500
APR	9.000	8.700	8.900	8.700	8.600	8.800
MAY	8.200	8.200	8.400	8.100	8.400	8.500
JUN	8.100	8.100	7.810	8.300	8.400	8.200
JUL	7.300	7.500	.	.	7.600	7.800
AUG	7.700	7.900	8.380	8.030	8.000	8.000
SEP	8.300	8.000	8.200	8.200	8.400	8.300
OCT	8.400	8.400	.	.	8.500	8.300
NOV	8.400	8.500	.	.	8.300	8.400
DEC	8.300	8.400	.	.	8.700	8.600

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
SODIUM (MG/L)			DET'N LIMIT = .200		GUIDELINE = 200 (C3)	
JAN	11.800	11.600	11.800	12.200	12.000	11.800
FEB	12.000	11.600	11.000	11.400	11.800	11.800
MAR	11.800	11.600	11.800	11.800	11.800	11.800
APR	12.000	12.000	11.800	12.200	12.000	12.200
MAY	11.200	11.400	11.600	11.200	11.400	11.400
JUN	11.800	11.600	11.600	11.600	11.600	11.800
JUL	11.400	10.000	.	.	11.600	11.800
AUG	11.600	11.600	11.200	11.400	12.000	11.800
SEP	11.600	11.600	11.600	11.600	11.600	11.000
OCT	11.600	11.400	.	.	11.400	11.400
NOV	12.400	12.400	.	.	12.200	12.300
DEC	12.000	12.200	.	.	11.000	11.200
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002		GUIDELINE = .05 (F2)	
JAN	.004 <T	.004 <T	.002 <T	.006 <T	.008 <T	.006 <T
FEB	.010	.014	.012	.014	.014	.014
MAR	BDL	BDL	BDL	BDL	.002 <T	BDL
APR	.020	.002 <T	.004 <T	.002 <T	.008 <T	.002 <T
MAY	.026	.002 <T	.002 <T	.002 <T	.006 <T	BDL
JUN	.016	.010	BDL	BDL	BDL	BDL
JUL	BDL	.002 <T	.	.	BDL	.002 <T
AUG	.002 <T	.002 <T	.002 <T	.004 <T	.002 <T	BDL
SEP	BDL	.004 <T	.002 <T	.002 <T	.004 <T	.004 <T
OCT	BDL	BDL	.	.	BDL	BDL
NOV	.010	BDL	.	.	.038	.004 <T
DEC	.002 <T	BDL	.	.	BDL	BDL
NITRITE (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)	
JAN	.001 <T	.001 <T	.002 <T	.003 <T	.002 <T	.001 <T
FEB	.003 <T	.002 <T	.002 <T	.002 <T	.002 <T	.002 <T
MAR	.002 <T	BDL	.001 <T	.001 <T	BDL	BDL
APR	.003 <T	.001 <T	.001 <T	.001 <T	.001 <T	.001 <T
MAY	.003 <T	.001 <T	.001 <T	.001 <T	.001 <T	.001 <T
JUN	.004 <T	.002 <T	.003 <T	.002 <T	.002 <T	.003 <T
JUL	.006	BDL	.	.	.002 <T	.001 <T
AUG	.003 <T	.001 <T	.002 <T	.003 <T	BDL	BDL
SEP	.004 <T	.004 <T	.002 <T	.002 <T	.002 <T	.002 <T
OCT	.001 <T	.001 <T	.	.	.001 <T	.001 <T
NOV	BDL	BDL	.	.	.004 <T	.001 <T
DEC	.002 <T	.001 <T	.	.	.001 <T	.001 <T
TOTAL NITRATES (MG/L)			DET'N LIMIT = .020		GUIDELINE = 10.000 (A1)	
JAN	.315	.275	.275	.270	.270	.270
FEB	.305	.300	.315	.305	.310	.315
MAR	.310	.310	.325	.325	.320	.315
APR	.315	.335	.325	.310	.330	.320

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	.295	.290	.310	.300	.295	.300
JUN	.265	.250	.270	.240	.240	.215
JUL	.315	.290	.	.	.175	.175
AUG	.340	.320	.345	.235	.310	.290
SEP	.155	.155	.210	.170	.190	.190
OCT	.195	.215	.	.	.215	.215
NOV	.190	.180	.	.	.275	.200
DEC	.265	.265	.	.	.275	.265
NITROGEN TOT KJELD (MG/L)			DET'N LIMIT = .020		GUIDELINE = N/A	
JAN	.210	.170	.170	.190	.170	.160
FEB	.210	.190	.160	.160	.160	.150
MAR	.230	.100	.110	.180	.210	.180
APR	.280	.190	.150	.170	.190	.200
MAY	.370	.230	.170	.180	.190	.160
JUN	.240	.170	.150	.240	.180	.170
JUL	.260	.180	.	.	.200	.170
AUG	.260	.180	.180	.170	.190	.180
SEP	.270	.210	.160	.210	.190	.170
OCT	.240	.180	.	.	.200	.170
NOV	.290	.200	.	.	.190	.200
DEC	.250	.180	.	.	.230	.220
PH (DMNSLESS)			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)	
JAN	8.300	8.290	8.190	8.210	8.160	8.100
FEB	8.190	8.120	8.020	8.020	8.030	7.950
MAR	8.270	8.210	8.190	8.210	8.150	8.180
APR	8.210	8.280	8.290	8.220	8.220	8.260
MAY	8.340	8.340	8.360	8.310	8.320	8.260
JUN	8.260	8.180	8.260	8.300	8.140	8.170
JUL	8.020	7.990	.	.	7.870	7.830
AUG	8.350	8.350	8.270	8.260	8.320	8.330
SEP	8.250	8.240	8.120	8.090	8.100	8.140
OCT	8.330	8.310	.	.	8.190	8.180
NOV	8.320	8.190	.	.	8.170	8.290
DEC	8.340	8.220	.	.	8.290	8.250
PHOSPHORUS FIL REACT (MG/L)			DET'N LIMIT = .0005		GUIDELINE = N/A	
JAN	.000 <T	BDL	.	.	.	.
FEB	BDL	BDL	.	.	.	.
MAR	BDL	BDL	.	.	.	.
APR	.000 <T	BDL	.	.	.	.
MAY	BDL	BDL	.	.	.	.
JUN	.000 <T	BDL	.	.	.	.
JUL	.001 <T	.000 <T	.	.	.	.
AUG	BDL	BDL	.	.	.	.
SEP	.000 <T	BDL	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
OCT	.001 <T	.001 <T	.	.	.	.
NOV	BDL	BDL	.	.	.	.
DEC	.002	BDL	.	.	.	.
PHOSPHORUS TOTAL (MG/L)			DET'N LIMIT = .002		GUIDELINE = .40 (F2)	
JAN	.011	.003 <T	.	.	.	.
FEB	.008 <T	.003 <T	.	.	.	.
MAR	.008 <T	BDL	.	.	.	.
APR	.005 <T	BDL	.	.	.	.
MAY	.013	.003 <T	.	.	.	.
JUN	.016	.005 <T	.	.	.	.
JUL	.014	.006 <T	.	.	.	.
AUG	.012	.003 <T	.	.	.	.
SEP	.011	.002 <T	.	.	.	.
OCT	.008 <T	BDL	.	.	.	.
NOV	.010	.002 <T	.	.	.	.
DEC	.013	BDL	.	.	.	.
SULPHATE (MG/L)			DET'N LIMIT = .200		GUIDELINE = 500. (A3)	
JAN	24.120	27.540	27.890	27.150	28.060	28.240
FEB	24.770	29.330	28.840	27.460	29.400	29.410
MAR	25.420	29.460	29.370	29.300	29.380	29.390
APR	24.060	28.390	29.010	29.320	28.940	29.130
MAY	22.920	27.480	27.520	26.770	27.730	27.570
JUN	25.010	29.350	29.000	28.720	29.280	29.170
JUL	24.380	28.300	.	.	28.920	28.880
AUG	24.350	28.450	28.740	28.930	29.060	29.080
SEP	26.860	30.620	30.290	30.170	30.660	30.600
OCT	24.720	28.400	.	.	28.810	28.790
NOV	26.460	30.190	.	.	30.660	30.850
DEC	26.950	30.870	.	.	31.120	31.560
TURBIDITY (FTU)			DET'N LIMIT = .02		GUIDELINE = 1.00 (A1)	
JAN	1.070	.190 <T	.740	.820	.280	.250 <T
FEB	.500	.200 <T	.600	.550	.280	.230 <T
MAR	1.200	.400	.900	.670	.370	.370
APR	1.280	.560	.630	.710	.450	.450
MAY	1.150	.320	.470	.510	.550	.320
JUN	.890	.210	.800	.590	.310	.270
JUL	.950	.530	.	.	.550	.390
AUG	1.400	.810	.780	.550	.720	.900
SEP	1.590	.580	.200 <T	.470	.180 <T	.140 <T
OCT	.870	.600	.	.	.390	.400
NOV	.950	.180	.	.	.340	.320
DEC	1.800	.260	.	.	.440	.600

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
METALS						
SILVER (UG/L)				DET'N LIMIT = .020 GUIDELINE = 50. (A1)		
JAN	BDL	BDL	BDL	BDL	BDL	BDL
FEB	BDL	BDL	BDL	BDL	BDL	BDL
MAR	BDL	BDL	BDL	BDL	BDL	BDL
APR	BDL	BDL	BDL	.030 <T	BDL	BDL
MAY	BDL	BDL	.050 <T	.060 <T	BDL	BDL
JUN	.050 <T	.060 <T	BDL	.080 <T	BDL	.030 <T
JUL	BDL	BDL	.	.	.050 <T	BDL
AUG	.040 <T	.050 <T	BDL	BDL	BDL	BDL
SEP	.040 <T	.050 <T	BDL	BDL	BDL	BDL
OCT	BDL	BDL	.	.	BDL	BDL
NOV	BDL	BDL	.	.	BDL	BDL
DEC	BDL	BDL	.	.	BDL	BDL
ALUMINUM (UG/L)				DET'N LIMIT = .050 GUIDELINE = 100.(A4)		
JAN	13.920	48.720	51.040	40.600	45.240	45.240
FEB	8.932	51.040	41.760	37.120	42.920	41.760
MAR	7.308	46.400	4.756	7.308	44.080	42.920
APR	9.744	33.640	40.600	34.800	44.080	41.760
MAY	9.860	82.360	54.520	73.080	76.560	75.400
JUN	6.500	95.000	63.000	68.000	77.000	77.000
JUL	6.900	53.000	.	.	62.000	58.000
AUG	9.000	78.000	55.000	74.000	74.000	71.000
SEP	7.200	200.000	94.000	150.000	140.000	150.000
OCT	7.800	130.000	.	.	120.000	110.000
NOV	7.900	99.000	.	.	89.000	90.000
DEC	22.000	63.000	.	.	68.000	59.000
ARSENIC (UG/L)				DET'N LIMIT = 0.050 GUIDELINE = 50.0 (A1)		
JAN	.990 <T	.360 <T	.440 <T	.530 <T	.510 <T	.480 <T
FEB	.790 <T	.310 <T	.210 <T	.190 <T	.390 <T	.240 <T
MAR	1.500	.960 <T	.930 <T	1.100	.920 <T	.960 <T
APR	1.100	.800 <T	.550 <T	.860 <T	.770 <T	.980 <T
MAY	1.400	1.100	1.000 <T	1.200	1.400	1.200
JUN	1.800	1.000 <T	.860 <T	1.300	1.200	1.200
JUL	1.000 <T	.300 <T	.	.	1.300	.150 <T
AUG	1.700	1.100	.780 <T	.830 <T	1.000 <T	.990 <T
SEP	1.800	1.600	.640 <T	1.200	1.200	.960 <T
OCT	.740 <T	.510 <T	.	.	.470 <T	.510 <T
NOV	.700 <T	.470 <T	.	.	.280 <T	.270 <T
DEC	.900 <T	.180 <T	.	.	.410 <T	.520 <T
BARIUM (UG/L)				DET'N LIMIT = 0.020 GUIDELINE = 1000. (A1)		
JAN	23.000	22.000	23.000	22.000	23.000	22.000
FEB	23.000	23.000	24.000	23.000	23.000	23.000
MAR	25.000	23.000	6.500	8.100	22.000	22.000

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
APR	24.000	24.000	25.000	22.000	23.000	22.000
MAY	26.000	25.000	26.000	24.000	26.000	25.000
JUN	25.000	24.000	27.000	24.000	25.000	25.000
JUL	23.000	22.000	.	.	26.000	26.000
AUG	25.000	24.000	28.000	25.000	24.000	24.000
SEP	22.000	22.000	25.000	24.000	24.000	24.000
OCT	23.000	23.000	.	.	23.000	23.000
NOV	23.000	22.000	.	.	22.000	21.000
DEC	23.000	23.000	.	.	25.000	23.000
BORON (UG/L)			DET'N LIMIT = 0.200 GUIDELINE = 5000. (A1)			
JAN	27.000	26.000	27.000	28.000	60.000	64.000
FEB	25.000	47.000	37.000	68.000	69.000	42.000
MAR	64.000	55.000	23.000	22.000	80.000	89.000
APR	26.000	110.000	230.000	160.000	210.000	220.000
MAY	33.000	45.000	130.000	130.000	68.000	150.000
JUN	29.000	28.000	38.000	37.000	39.000	39.000
JUL	22.000	23.000	.	.	52.000	38.000
AUG	57.000	61.000	55.000	53.000	69.000	71.000
SEP	44.000	41.000	53.000	53.000	52.000	51.000
OCT	26.000	33.000	.	.	34.000	32.000
NOV	26.000	24.000	.	.	25.000	23.000
DEC	30.000	30.000	.	.	31.000	27.000
BERYLLIUM (UG/L)			DET'N LIMIT = 0.010 GUIDELINE = N/A			
JAN	.040 <T	BDL	.030 <T	BDL	BDL	.040 <T
FEB	BDL	.080 <T	.130 <T	.130 <T	.100 <T	.050 <T
MAR	.170 <T	.040 <T	.020 <T	BDL	.160 <T	.240 <T
APR	.020 <T	.100 <T	.200 <T	.100 <T	.180 <T	.270 <T
MAY	BDL	.110 <T	.230 <T	.220 <T	.100 <T	.240 <T
JUN	.020 <T	.040 <T	.080 <T	.140 <T	.120 <T	.110 <T
JUL	.050 <T	.050 <T	.	.	BDL	.070 <T
AUG	.040 <T	.150 <T	.040 <T	.020 <T	.180 <T	BDL
SEP	.050 <T	.080 <T	.090 <T	.070 <T	.060 <T	.120 <T
OCT	BDL	.020 <T	.	.	BDL	.030 <T
NOV	.040 <T	BDL	.	.	BDL	BDL
DEC	BDL	BDL	.	.	.020 <T	BDL
CADMIUM (UG/L)			DET'N LIMIT = 0.050 GUIDELINE = 5.000 (A1)			
JAN	BDL	BDL	BDL	BDL	BDL	BDL
FEB	BDL	BDL	BDL	BDL	BDL	BDL
MAR	.190 <T	.130 <T	.120 <T	.110 <T	.080 <T	BDL
APR	BDL	.110 <T	.080 <T	.130 <T	.110 <T	.120 <T
MAY	BDL	BDL	BDL	BDL	.090 <T	.140 <T
JUN	.130 <T	.060 <T	BDL	BDL	.150 <T	.170 <T
JUL	BDL	BDL	.	.	BDL	.060 <T
AUG	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
			SITE 1		SITE 2	
	RAW	TREATED	STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	BDL	BDL	BDL	.060 <T	BDL	BDL
OCT	BDL	BDL	.	.	BDL	BDL
NOV	BDL	BDL	.	.	BDL	.070 <T
DEC	.070 <T	.090 <T	.	.	BDL	BDL
COBALT (UG/L)			DET'N LIMIT = 0.020 GUIDELINE = N/A			
JAN	.080 <T	.090 <T	.120 <T	.120 <T	.140 <T	.250 <T
FEB	.060 <T	.050 <T	.060 <T	.070 <T	.050 <T	.070 <T
MAR	.080 <T	.170 <T	.100 <T	.120 <T	.190 <T	.210 <T
APR	.100 <T	.070 <T	.040 <T	.060 <T	.090 <T	.030 <T
MAY	.120 <T	.120 <T	.220 <T	.150 <T	.260 <T	.290 <T
JUN	BDL	.040 <T	.270 <T	BDL	.050 <T	.030 <T
JUL	.190 <T	.220 <T	.	.	.260 <T	.220 <T
AUG	.120 <T	.110 <T	.070 <T	.100 <T	.120 <T	.100 <T
SEP	.140 <T	.030 <T	.090 <T	.170 <T	.120 <T	.160 <T
OCT	.060 <T	.050 <T	.	.	.030 <T	BDL
NOV	.040 <T	.100 <T	.	.	.110 <T	.140 <T
DEC	.160 <T	.100 <T	.	.	.050 <T	.090 <T
CHROMIUM (UG/L)			DET'N LIMIT = 0.100 GUIDELINE = 50. (A1)			
JAN	.760 <T	.450 <T	.130 <T	.580 <T	5.700	6.200
FEB	.520 <T	3.400	2.000	5.700	5.700	2.600
MAR	5.600	4.000	.260 <T	.150 <T	6.200	7.300
APR	.580 <T	4.300	8.800	6.000	8.500	8.600
MAY	.930 <T	1.700	8.400	8.400	3.500	8.700
JUN	1.100	1.100	4.500	4.300	4.800	4.600
JUL	.980 <T	1.200	.	.	4.800	4.700
AUG	5.200	5.900	6.000	5.300	6.800	7.100
SEP	4.000	3.300	5.300	5.400	5.500	5.000
OCT	.340 <T	3.200	.	.	3.900	3.500
NOV	.550 <T	.640 <T	.	.	.560 <T	.480 <T
DEC	2.000	1.800	.	.	.370 <T	.770 <T
COPPER (UG/L)			DET'N LIMIT = .100 GUIDELINE = 1000 (A3)			
JAN	52.000	1.500	83.000	4.600	8.200	2.600
FEB	37.000	1.300	78.000	4.700	11.000	3.300
MAR	33.000	1.200	19.000	7.700	10.000	3.100
APR	39.000	1.200	120.000	4.300	11.000	3.000
MAY	49.000	1.300	94.000	5.900	9.700	3.400
JUN	55.000	1.800	110.000	5.700	12.000	4.300
JUL	82.000	1.300	.	.	12.000	4.100
AUG	90.000	.870 <T	95.000	5.100	11.000	3.800
SEP	49.000	1.400	85.000	5.600	11.000	4.400
OCT	50.000	1.100	.	.	9.900	3.300
NOV	53.000	1.100	.	.	8.000	3.500
DEC	110.000	1.300	.	.	9.700	3.200

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
IRON (UG/L)				DET'N LIMIT = 4.000 GUIDELINE = 300. (A3)		
JAN	23.000 <T	10.000 <T	170.000	190.000	56.000	47.000 <T
FEB	16.000 <T	BDL	160.000	160.000	43.000 <T	43.000 <T
MAR	7.800 <T	BDL	13.000 <T	27.000 <T	37.000 <T	48.000 <T
APR	9.200 <T	BDL	130.000	140.000	39.000 <T	43.000 <T
MAY	30.000 <T	21.000 <T	140.000	140.000	43.000 <T	42.000 <T
JUN	20.000 <T	9.300 <T	210.000	120.000	41.000 <T	42.000 <T
JUL	BDL	BDL	.	.	42.000 <T	33.000 <T
AUG	11.000 <T	BDL	140.000	110.000	36.000 <T	35.000 <T
SEP	BDL	BDL	140.000	140.000	54.000	53.000
OCT	11.000 <T	BDL	.	.	47.000 <T	43.000 <T
NOV	12.000 <T	BDL	.	.	37.000 <T	35.000 <T
DEC	23.000 <T	BDL	.	.	38.000 <T	38.000 <T
MERCURY (UG/L)				DET'N LIMIT = 0.010 GUIDELINE = 1.000 (A1)		
JAN	BDL	BDL	.	BDL	.	BDL
FEB	BDL	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	BDL	.	BDL
APR	BDL	BDL	.	BDL	.	BDL
MAY	BDL	BDL	.	BDL	.	BDL
JUN	BDL	BDL	.	BDL	.	BDL
JUL	BDL	BDL	.	.	.	BDL
AUG	.020 <T	.020 <T	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	BDL
OCT	BDL	BDL	.	.	.	BDL
NOV	BDL	BDL	.	.	.	BDL
DEC	.030 <T	.020 <T	.	.	.	.030 <T
MANGANESE (UG/L)				DET'N LIMIT = .050 GUIDELINE = 50.0 (A3)		
JAN	1.600	.190 <T	5.600	5.000	1.600	1.600
FEB	1.400	.240 <T	5.200	4.800	1.600	1.600
MAR	1.500	.250 <T	.550	.870	1.500	1.500
APR	2.800	.670	4.800	4.500	1.900	1.900
MAY	3.400	.400 <T	4.000	4.400	2.000	2.000
JUN	7.700	.230 <T	6.500	5.700	2.100	2.100
JUL	9.000	.840	.	.	2.100	2.300
AUG	17.000	1.500	6.000	5.900	2.700	2.700
SEP	10.000	.300 <T	5.900	6.500	2.500	2.600
OCT	3.600	.350 <T	.	.	2.100	2.000
NOV	2.300	.190 <T	.	.	1.600	1.500
DEC	3.300	.380 <T	.	.	1.600	1.600
MOLYBDENUM (UG/L)				DET'N LIMIT = 0.020 GUIDELINE = N/A		
JAN	1.100	1.100	1.000	1.100	1.200	1.100
FEB	1.200	1.200	1.100	1.100	1.100	1.100
MAR	1.300	1.200	1.300	1.100	1.300	1.200
APR	1.300	1.300	1.200	1.300	1.300	1.300

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
			SITE 1		SITE 2	
	RAW	TREATED	STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	1.200	1.300	1.200	1.200	1.500	1.500
JUN	1.600	1.700	1.600	1.600	1.700	1.600
JUL	1.300	1.300	.	.	1.400	1.500
AUG	1.200	1.400	1.200	1.300	1.300	1.300
SEP	1.500	1.500	1.400	1.300	1.400	1.600
OCT	1.100	1.100	.	.	1.100	1.100
NOV	1.100	1.100	.	.	1.200	1.000
DEC	1.000	1.100	.	.	1.100	1.200
NICKEL (UG/L)			DET'N LIMIT = 0.100 GUIDELINE = 50. (F3)			
JAN	.520 <T	.770 <T	1.200 <T	1.300 <T	1.600 <T	1.500 <T
FEB	BDL	BDL	BDL	BDL	BDL	BDL
MAR	BDL	BDL	.430 <T	.520 <T	.650 <T	.840 <T
APR	1.000 <T	.590 <T	1.000 <T	.590 <T	.770 <T	.670 <T
MAY	1.900 <T	1.500 <T	1.500 <T	1.500 <T	1.900 <T	1.800 <T
JUN	.840 <T	.120 <T	BDL	BDL	.370 <T	BDL
JUL	1.700 <T	1.500 <T	.	.	1.800 <T	.850 <T
AUG	1.800 <T	1.600 <T	.970 <T	.890 <T	1.900 <T	1.900 <T
SEP	.860 <T	1.100 <T	1.200 <T	.850 <T	1.600 <T	1.000 <T
OCT	.900 <T	.430 <T	.	.	.700 <T	.510 <T
NOV	1.500 <T	1.600 <T	.	.	1.300 <T	1.000 <T
DEC	.910 <T	1.200 <T	.	.	.900 <T	.900 <T
LEAD (UG/L)			DET'N LIMIT = 0.050 GUIDELINE = 50. (A1)			
JAN	.170 <T	.100 <T	16.000	.330	.380	.080 <T
FEB	.070 <T	.050 <T	11.000	.190 <T	.430	.110 <T
MAR	.380	.120 <T	6.400	1.300	.660	.300
APR	.390	.070 <T	12.000	.350	.530	.200 <T
MAY	.410	.250	11.000	.560	.490	.260
JUN	.080 <T	BDL	12.000	.370	.640	.270
JUL	.220	BDL	.	.	.820	.380
AUG	.170 <T	.180 <T	14.000	.690	.760	.410
SEP	.290	.060 <T	12.000	.800	.890	.580
OCT	.120 <T	.070 <T	.	.	.500	.150 <T
NOV	.160 <T	.070 <T	.	.	.480	.170 <T
DEC	.310	.300	.	.	.480	.120 <T
ANTIMONY (UG/L)			DET'N LIMIT = .050 GUIDELINE = 146. (D4)			
JAN	.520	.470	.470	.520	.550	.720
FEB	.560	.570	.430	.480	.450	.560
MAR	.790	1.100	.920	.890	.610	.670
APR	.800	.810	.770	.680	.690	.580
MAY	.800	.780	1.000	.830	1.000	.950
JUN	1.100	.950	1.500	.950	.980	1.000
JUL	.740	.640	.	.	.850	.900
AUG	.650	.800	.770	.670	.700	.780
SEP	.930	.830	.720	.770	.720	.950

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
OCT	.550	.650	.	.	.520	.490
NOV	.420	.350	.	.	.370	.470
DEC	.580	.620	.	.	.420	.630
SELENIUM (UG/L)			DET'N LIMIT = 0.200 GUIDELINE = 10. (A1)			
JAN	.260 <T	.430 <T	1.100 <T	1.800 <T	2.000 <T	1.400 <T
FEB	1.400 <T	1.900 <T	2.100 <T	1.500 <T	2.900 <T	2.300 <T
MAR	4.600 <T	5.700 <T	5.600 <T	4.800 <T	6.500 <T	4.200 <T
APR	3.400 <T	4.800 <T	4.200 <T	4.800 <T	4.700 <T	4.800 <T
MAY	.840 <T	.960 <T	2.800 <T	5.400 <T	1.900 <T	5.200 <T
JUN	1.800 <T	2.300 <T	4.400 <T	4.600 <T	5.200 <T	6.600 <T
JUL	1.800 <T	2.700 <T	.	.	3.900 <T	4.300 <T
AUG	1.500 <T	4.700 <T	4.100 <T	4.800 <T	3.500 <T	4.300 <T
SEP	2.800 <T	6.100	4.000 <T	2.900 <T	3.400 <T	4.300 <T
OCT	BDL	BDL	.	.	BDL	BDL
NOV	BDL	BDL	.	.	BDL	BDL
DEC	BDL	1.200 <T	.	.	BDL	1.100 <T
STRONTIUM (UG/L)			DET'N LIMIT = .050 GUIDELINE = N/A			
JAN	180.000	170.000	180.000	170.000	170.000	170.000
FEB	180.000	170.000	180.000	180.000	180.000	180.000
MAR	180.000	180.000	76.000	99.000	170.000	170.000
APR	190.000	200.000	200.000	180.000	180.000	180.000
MAY	200.000	190.000	200.000	190.000	190.000	190.000
JUN	190.000	190.000	190.000	190.000	190.000	190.000
JUL	180.000	180.000	.	.	190.000	190.000
AUG	170.000	180.000	190.000	180.000	180.000	170.000
SEP	170.000	180.000	190.000	180.000	190.000	180.000
OCT	170.000	180.000	.	.	180.000	170.000
NOV	180.000	180.000	.	.	180.000	160.000
DEC	180.000	180.000	.	.	180.000	180.000
TITANIUM (UG/L)			DET'N LIMIT = .050 GUIDELINE = N/A			
JAN	3.700	3.400	3.100	4.000	2.200	2.200
FEB	4.200	3.700	3.200	3.300	2.300	1.700 <T
MAR	5.000	4.500	.460 <T	.290 <T	3.800	3.400
APR	7.400	5.900	6.800	6.900	6.500	5.700
MAY	4.900	4.800	4.700	4.900	4.300	3.800
JUN	7.100	8.400	8.500	5.900	4.900	5.600
JUL	5.900	5.800	.	.	6.000	4.000
AUG	5.300	5.800	4.600	4.700	4.400	3.900
SEP	6.200	5.800	4.700	4.400	4.000	4.400
OCT	3.600	4.000	.	.	3.000	2.800
NOV	3.100	2.800	.	.	2.300	2.000 <T
DEC	4.100	3.200	.	.	2.600	2.800
THALLIUM (UG/L)			DET'N LIMIT = .010 GUIDELINE = 13. (D4)			

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1990

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
JAN	BDL	BDL	BDL	BDL	.030 <T	BDL
FEB	BDL	BDL	BDL	BDL	BDL	BDL
MAR	.120 <T	.030 <T	.020 <T	.060 <T	.020 <T	.060 <T
APR	.090 <T	.070 <T	.070 <T	.080 <T	.040 <T	.070 <T
MAY	.030 <T	BDL	.020 <T	.040 <T	.040 <T	.030 <T
JUN	.060 <T	.040 <T	.050 <T	.080 <T	.100 <T	.080 <T
JUL	.100 <T	BDL	.	.	BDL	.020 <T
AUG	.050 <T	BDL	BDL	BDL	.090 <T	.040 <T
SEP	.090 <T	.070 <T	.060 <T	BDL	.080 <T	BDL
OCT	BDL	BDL	.	.	BDL	BDL
NOV	BDL	BDL	.	.	BDL	BDL
DEC	BDL	BDL	.	.	BDL	BDL
URANIUM (UG/L)			DET'N LIMIT = .020		GUIDELINE = 100.(B1)	
JAN	.410	.330	.270	.310	.290	.320
FEB	.310	.310	.330	.330	.320	.360
MAR	.600	.540	.170 <T	.330	.460	.450
APR	.440	.460	.440	.450	.420	.360
MAY	.450	.500	.460	.510	.500	.470
JUN	.510	.480	.470	.500	.450	.500
JUL	.510	.450	.	.	.490	.530
AUG	.530	.470	.390	.450	.480	.430
SEP	.390	.450	.540	.590	.580	.590
OCT	.270	.310	.	.	.300	.250
NOV	.190 <T	.270	.	.	.310	.270
DEC	.300	.340	.	.	.270	.300
VANADIUM (UG/L)			DET'N LIMIT = .050		GUIDELINE = N/A	
JAN	.320 <T	.320 <T	.300 <T	.270 <T	.240 <T	.260 <T
FEB	.110 <T	.020 <T	.020 <T	.010 <T	.020 <T	.020 <T
MAR	.180 <T	.120 <T	BDL	.040 <T	.190 <T	.170 <T
APR	.270 <T	.520	.200 <T	.310 <T	.310 <T	.370 <T
MAY	.320 <T	.650	.310 <T	.410 <T	.530	.570
JUN	.310 <T	.630	.330 <T	.400 <T	.440 <T	.460 <T
JUL	.350 <T	.620	.	.	.630	.580
AUG	.310 <T	.590	.360 <T	.410 <T	.560	.590
SEP	.350 <T	.740	.350 <T	.460 <T	.580	.590
OCT	.300 <T	.600	.	.	.510	.470 <T
NOV	.250 <T	.520	.	.	.400 <T	.450 <T
DEC	.250 <T	.460 <T	.	.	.330 <T	.380 <T
ZINC (UG/L)			DET'N LIMIT = .001		GUIDELINE = 5000. (A3)	
JAN	2.000	.990 <T	51.000	2.200	9.300	2.000
FEB	1.800	1.600	43.000	2.000	9.700	2.400
MAR	2.100	1.900	8.500	1.100	8.300	2.300
APR	2.500	1.500	67.000	2.400	9.500	2.300
MAY	5.600	3.300	48.000	3.700	11.000	2.800

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
JUN	3.400	2.800	61.000	2.600	10.000	3.100
JUL	3.000	2.100	.	.	11.000	3.200
AUG	2.000	.960 <T	34.000	2.200	8.900	2.500
SEP	3.000	2.200	32.000	2.300	7.600	2.700
OCT	1.800	.800 <T	.	.	7.000	1.500
NOV	2.400	2.000	.	.	7.900	3.000
DEC	3.200	1.200	.	.	11.000	1.700

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
PESTICIDES & PCB						
ALPHA BHC (NG/L)			**DET'N LIMIT = 1.000**		**GUIDELINE = 700 (G)**	
JAN	BDL	2.000 <T	.	2.000 <T	.	BDL
FEB	2.000 <T	2.000 <T	.	1.000 <T	.	9.000 <T
MAR	BDL	BDL	.	BDL	.	BDL
APR	IPE	IPE	.	IPE	.	IPE
MAY	BDL	BDL	.	BDL	.	2.000 <T
JUN	1.000 <T	3.000 <T	.	1.000 <T	.	1.000 <T
JUL	2.000 <T	2.000 <T	.	.	.	2.000 <T
AUG	BDL	BDL	.	1.000 <T	.	1.000 <T
SEP	BDL	BDL	.	BDL	.	BDL
OCT	BDL	BDL	.	.	.	BDL
NOV	BDL	1.000 <T	.	.	.	BDL
DEC	BDL	1.000 <T	.	.	.	BDL
LINDANE (NG/L)			**DET'N LIMIT = 1.000**		**GUIDELINE = 4000 (A1)**	
JAN	1.000 <T	BDL	.	BDL	.	BDL
FEB	1.000 <T	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	BDL	.	BDL
APR	IPE	IPE	.	IPE	.	IPE
MAY	BDL	BDL	.	BDL	.	BDL
JUN	BDL	BDL	.	BDL	.	BDL
JUL	BDL	BDL	.	.	.	BDL
AUG	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	BDL
OCT	BDL	BDL	.	.	.	BDL
NOV	BDL	BDL	.	.	.	BDL
DEC	BDL	BDL	.	.	.	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
PHENOLICS (UG/L)	PHENOLICS		DET'N LIMIT = 0.2		GUIDELINE = 2.00 (A3)	
JAN	1.000	1.200	.	.	.	.
FEB	2.000	1.800	.	.	.	.
MAR	.800 <T	.600 <T	.	.	.	.
APR	1.600	1.600	.	.	.	.
MAY	4.400	4.200	.	.	.	.
JUN	2.800	.	.	.	.	.
JUL	1.600	1.000	.	.	.	.
AUG	1.000 <T	.600 <T	.	.	.	.
SEP	.600 <T	5.600	.	.	.	.
OCT	1.200	11.400	.	.	.	.
NOV	1.000	.600 <T	.	.	.	.
DEC	1.200	1.400	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
VOLATILES						
BENZENE (UG/L)				DET'N LIMIT = .050	GUIDELINE = 5.0 (81)	
JAN	BDL	BDL	-	BDL	-	BDL
FEB	BDL	BDL	-	BDL	-	BDL
MAR	.050 <T	BDL	-	BDL	-	BDL
APR	BDL	BDL	-	BDL	-	BDL
MAY	BDL	BDL	-	.050 <T	-	BDL
JUN	BDL	BDL	-	BDL	-	BDL
JUL	IU	BDL	-	-	-	BDL
AUG	BDL	BDL	-	BDL	-	BDL
SEP	BDL	BDL	-	BDL	-	BDL
OCT	BDL	BDL	-	-	-	BDL
NOV	BDL	BDL	-	-	-	BDL
DEC	BDL	BDL	-	-	-	BDL
TOLUENE (UG/L)				DET'N LIMIT = .050	GUIDELINE = 24.0 (84)	
JAN	BDL	.050 <T	-	BDL	-	BDL
FEB	BDL	BDL	-	BDL	-	BDL
MAR	.100 <T	.050 <T	-	BDL	-	BDL
APR	BDL	.100 <T	-	.050 <T	-	BDL
MAY	BDL	BDL	-	BDL	-	.050 <T
JUN	BDL	BDL	-	BDL	-	BDL
JUL	IU	.100 <T	-	-	-	BDL
AUG	.050 <T	BDL	-	BDL	-	.100 <T
SEP	.100 <T	BDL	-	BDL	-	.100 <T
OCT	BDL	BDL	-	-	-	BDL
NOV	BDL	BDL	-	-	-	BDL
DEC	BDL	BDL	-	-	-	BDL
ETHYLBENZENE (UG/L)				DET'N LIMIT = .050	GUIDELINE = 2.4 (84)	
JAN	.050 <T	.100 <T	-	BDL	-	BDL
FEB	BDL	BDL	-	BDL	-	BDL
MAR	.100 <T	BDL	-	BDL	-	BDL
APR	BDL	.050 <T	-	BDL	-	BDL
MAY	BDL	BDL	-	BDL	-	BDL
JUN	BDL	BDL	-	BDL	-	BDL
JUL	IU	BDL	-	-	-	BDL
AUG	BDL	BDL	-	BDL	-	BDL
SEP	BDL	BDL	-	BDL	-	BDL
OCT	BDL	BDL	-	-	-	BDL
NOV	BDL	BDL	-	-	-	BDL
DEC	BDL	BDL	-	-	-	BDL
M-XYLENE (UG/L)				DET'N LIMIT = .100	GUIDELINE = 300 (84)	
JAN	BDL	.100 <T	-	BDL	-	BDL
FEB	BDL	BDL	-	BDL	-	BDL
MAR	BDL	BDL	-	BDL	-	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
APR	BDL	BDL	.	BDL	.	BDL
MAY	BDL	BDL	.	BDL	.	BDL
JUN	BDL	BDL	.	BDL	.	BDL
JUL	IU	BDL	.	.	.	BDL
AUG	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	BDL
OCT	BDL	BDL	.	.	.	BDL
NOV	BDL	BDL	.	.	.	BDL
DEC	BDL	BDL	.	.	.	BDL
O-XYLENE (UG/L)				DET'N LIMIT = .050 GUIDELINE = 300 (B4)		
JAN	.050 <T	.100 <T	.	BDL	.	BDL
FEB	BDL	BDL	.	BDL	.	BDL
MAR	BDL	BDL	.	BDL	.	BDL
APR	BDL	BDL	.	BDL	.	BDL
MAY	BDL	BDL	.	BDL	.	BDL
JUN	BDL	BDL	.	BDL	.	BDL
JUL	IU	BDL	.	.	.	BDL
AUG	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	BDL
OCT	BDL	BDL	.	.	.	BDL
NOV	BDL	.050 <T	.	.	.	BDL
DEC	BDL	BDL	.	.	.	BDL
STYRENE (UG/L)				DET'N LIMIT = .050 GUIDELINE = 46.5 (D2)		
JAN	.350 <T	.400 <T	.	.150 <T	.	.050 <T
FEB	.050 <T	.100 <T	.	.200 <T	.	.150 <T
MAR	.450 <T	.100 <T	.	.200 <T	.	.050 <T
APR	.200 <T	.250 <T	.	.200 <T	.	.100 <T
MAY	.200 <T	.050 <T	.	.100 <T	.	.150 <T
JUN	.200 <T	.050 <T	.	.150 <T	.	.150 <T
JUL	IU	.150 <T	.	.	.	.250 <T
AUG	.100 <T	BDL	.	BDL	.	.100 <T
SEP	.100 <T	BDL	.	.100 <T	.	.100 <T
OCT	BDL	.100 <T	.	.	.	.050 <T
NOV	.050 <T	.050 <T	.	.	.	.050 <T
DEC	BDL	BDL	.	.	.	.050 <T
CHLOROFORM (UG/L)				DET'N LIMIT = .100 GUIDELINE = 350 (A1+)		
JAN	BDL	7.800	.	5.700	.	6.900
FEB	BDL	9.000	.	6.300	.	7.500
MAR	BDL	11.300	.	7.600	.	11.900
APR	.400 <T	17.700	.	7.800	.	8.800
MAY	BDL	20.700	.	14.800	.	14.900
JUN	BDL	16.700	.	12.200	.	13.700
JUL	IU	19.200	.	.	.	15.900
AUG	BDL	16.600	.	14.300	.	14.500

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	.300 <T	18.400	.	12.500	.	15.600
OCT	BDL	11.800	.	.	.	10.500
NOV	BDL	14.600	.	.	.	9.900
DEC	BDL	10.300	.	.	.	7.500
111, TRICHLOROETHANE (UG/L)				DET'N LIMIT = .020 GUIDELINE = 200 (D1)		
JAN	BDL	BDL	.	BDL	.	BDL
FEB	BDL	BDL	.	BDL	.	BDL
MAR	BDL	.020 <T	.	.020 <T	.	.020 <T
APR	.060 <T	BDL	.	BDL	.	BDL
MAY	.060 <T	BDL	.	BDL	.	BDL
JUN	BDL	BDL	.	BDL	.	BDL
JUL	IU	BDL	.	.	.	BDL
AUG	.040 <T	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	BDL
OCT	BDL	BDL	.	.	.	BDL
NOV	BDL	BDL	.	.	.	BDL
DEC	BDL	BDL	.	.	.	BDL
DICHLOROBROMOMETHANE (UG/L)				DET'N LIMIT = .050 GUIDELINE = 350 (A1+)		
JAN	BDL	9.100	.	6.950	.	8.250
FEB	BDL	9.300	.	6.750	.	7.750
MAR	BDL	9.400	.	6.600	.	9.100
APR	.100 <T	10.100	.	7.150	.	7.250
MAY	BDL	11.600	.	8.400	.	10.100
JUN	BDL	12.450	.	9.700	.	10.600
JUL	IU	12.450	.	.	.	10.050
AUG	BDL	12.400	.	10.200	.	10.500
SEP	BDL	12.600	.	9.100	.	11.250
OCT	BDL	10.100	.	.	.	8.700
NOV	BDL	11.100	.	.	.	8.600
DEC	BDL	8.700	.	.	.	7.500
CHLORODIBROMOMETHANE (UG/L)				DET'N LIMIT = .100 GUIDELINE = 350 (A1+)		
JAN	BDL	5.200	.	4.100	.	4.700
FEB	BDL	4.800	.	3.200	.	4.200
MAR	BDL	4.200	.	3.200	.	4.000
APR	BDL	3.200	.	3.600	.	2.800
MAY	BDL	3.800	.	2.700	.	3.700
JUN	BDL	5.300	.	4.200	.	4.400
JUL	IU	4.800	.	.	.	4.300
AUG	BDL	4.900	.	4.600	.	4.400
SEP	BDL	6.100	.	4.700	.	5.800
OCT	BDL	5.200	.	.	.	4.700
NOV	BDL	5.700	.	.	.	4.600
DEC	BDL	5.400	.	.	.	4.100

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KINGSTON WTP 1989

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM			
	RAW	TREATED	SITE 1		SITE 2	
			STANDING	FREE FLOW	STANDING	FREE FLOW
BROMOFORM (UG/L)				DET'N LIMIT = .200	GUIDELINE = 350 (A1+)	
JAN	BDL	.600 <T	.	.600 <T	.	.600 <T
FEB	BDL	.600 <T	.	.400 <T	.	.400 <T
MAR	BDL	.600 <T	.	.400 <T	.	.600 <T
APR	BDL	.200 <T	.	.400 <T	.	BDL
MAY	BDL	.400 <T	.	.200 <T	.	.200 <T
JUN	BDL	.400 <T	.	.400 <T	.	.400 <T
JUL	IU	.400 <T	.	.	.	.400 <T
AUG	BDL	.400 <T	.	.400 <T	.	.400 <T
SEP	BDL	.600 <T	.	.600 <T	.	.800 <T
OCT	BDL	.600 <T	.	.	.	.600 <T
NOV	BDL	.800 <T	.	.	.	.800 <T
DEC	BDL	.600 <T	.	.	.	.600 <T
1,4 DICHLOROBENZENE (UG/L)				DET'N LIMIT = .100	GUIDELINE = 5.0 (B1)	
JAN	BDL	.100 <T	.	BDL	.	BDL
FEB	BDL	BDL	.	BDL	.	BDL
MAR	BDL	.200 <T	.	BDL	.	BDL
APR	BDL	BDL	.	BDL	.	BDL
MAY	BDL	BDL	.	BDL	.	BDL
JUN	BDL	BDL	.	BDL	.	BDL
JUL	IU	BDL	.	.	.	BDL
AUG	BDL	BDL	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL	.	BDL
OCT	BDL	BDL	.	.	.	BDL
NOV	BDL	BDL	.	.	.	BDL
DEC	BDL	BDL	.	.	.	BDL
TOTL TRIHALOMETHANES (UG/L)				DET'N LIMIT = .500	GUIDELINE = 350 (A1)	
JAN	BDL	22.700	.	17.350	.	20.450
FEB	BDL	23.700	.	16.650	.	19.850
MAR	BDL	25.500	.	17.800	.	25.600
APR	.500 <T	31.000	.	18.950	.	18.850
MAY	BDL	36.500	.	26.100	.	28.900
JUN	BDL	34.850	.	26.500	.	29.100
JUL	IU	36.850	.	.	.	30.650
AUG	BDL	34.300	.	29.500	.	29.800
SEP	BDL	37.700	.	26.900	.	33.450
OCT	BDL	27.700	.	.	.	24.500
NOV	BDL	32.200	.	.	.	23.900
DEC	BDL	25.000	.	.	.	19.700

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

Table 6

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILTRATION	CT/ML	0	500/ML(A1)
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100mL(A1)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
CHLOROAROMATICS			
HEXACHLOROBUTADIENE	NG/L	1.000	450. (D4)
1,2,3-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,4-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.000	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.000	10000 (D4)
HEXACHLOROBENZENE	NG/L	1.0	10. (C1)
HEXACHLOROETHANE	NG/L	1.000	1900. (D4)
OCTACHLOROSTYRENE	NG/L	1.000	N/A
PENTACHLOROBENZENE	NG/L	1.000	74000 (D4)
2,3,6-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,6,A-TRICHLOROTOLUENE	NG/L	5.000	N/A
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	50.	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	50.	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	50.	N/A
2,4,5-TRICHLOROPHENOL	NG/L	50.	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	50.	2000. (B4)
PENTACHLOROPHENOL	NG/L	50.	30000. (B4)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD PH	DMSNLESS	N/A	6.5-8.5(A4)
FIELD TEMPERATURE	^{o}C	N/A	<15 ^{o}C(A1)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	.200	30-500(A4)
CALCIUM	MG/L	.100	100. (F2)
CYANIDE	MG/L	.001	.20(A1)
CHLORIDE	MG/L	.200	250. (A3)
COLOUR	TCU	.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.	400. (F2)
FLUORIDE	MG/L	.01	2.4 (A1)
HARDNESS	MG/L	.50	80-100(A4)
MAGNESIUM	MG/L	.05	30. (F2)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
NITRITE	MG/L	.001	1.[illegible] 1)
TOTAL NITRATES	MG/L	.02	10 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	.02	N/A
PH	DMSNLESS	N/A	6.5-8.5(A4)
PHOSPHORUS FIL REACT	MG/L	.0005	N/A
PHOSPHORUS TOTAL	MG/L	.002	.40(F2)
TOTAL SOLIDS	MG/L	1.	500. (A3)
TURBIDITY	FTU	.02	1.0 (A1)
METALS			
ALUMINUM	UG/L	.050	100. (A4)
ANTIMONY	UG/L	.050	10. (F3)
ARSENIC	UG/L	.050	50. (A1)
BARIUM	UG/L	.020	1000. (A1)
BORON	UG/L	.200	5000. (A1)
BERYLLIUM	UG/L	.010	0.20 (H)
CADMIUM	UG/L	.050	5.0 (A1)
COBALT	UG/L	.020	1000. (H)
CHROMIUM	UG/L	.100	50. (A1)
COPPER	UG/L	.100	1000. (A3)
IRON	UG/L	5.0	300. (A3)
MERCURY	UG/L	.01	1.0 (A1)
MANGANESE	UG/L	.050	50. (A3)
MOLYBDENUM	UG/L	.020	500. (H)
NICKEL	UG/L	.100	50. (F3)
LEAD	UG/L	.020	50. (A1)
SELENIUM	UG/L	.200	10. (A1)
SILVER	UG/L	.020	50. (A1)
STRONTIUM	UG/L	.100	2000. (H)
THALLIUM	UG/L	.010	13. (D4)
TITANIUM	UG/L	.100	N/A
URANIUM	UG/L	.020	20. (A2)
VANADIUM	UG/L	.020	100. (H)
ZINC	UG/L	.020	5000. (A3)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	.2	2.0 (A3)
PESTICIDES & PCB			
ALDRIN	NG/L	1.0	700. (A1)
AMETRINE	NG/L	50.	300000. (D3)
ATRAZINE	NG/L	50.	60000. (B3)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700. (G)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300. (G)
GAMMA HEXACHLOROCYCLOHEXANE(LINDANE)	NG/L	1.0	4000. (A1)
ALPHA CHLORDANE	NG/L	2.0	7000. (A1)
GAMMA CHLORDANE	NG/L	2.0	7000. (A1)
BLADEX	NG/L	100.	10000. (B3)
DIELDRIN	NG/L	2.0	700. (A1)
METHOXYCHLOR	NG/L	5.0	900000. (B1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000. (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	4.0	74000. (D4)
ENDRIN	NG/L	4.0	200. (A1)
ENDOSULFAN SULPHATE(THIODAN SULPHATE)	NG/L	4.0	N/A
HEPTACHLOR EPOXIDE	NG/L	1.0	3000. (A1)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
HEPTACHLOR	NG/L	1.0	3000.	(A1)
METOLACHLOR	NG/L	500.	50000.	(B3)
MIREX	NG/L	5.0	N/A	
OXYCHLORDANE	NG/L	2.0	N/A	
O,P-DDT	NG/L	5.0	30000.	(A1)
PCB	NG/L	20.0	3000.	(A2)
O,P-DDD	NG/L	5.0	N/A	
PPDDE	NG/L	1.0	30000.	(A1)
PPDDT	NG/L	5.0	30000.	(A1)
ATRATONE	NG/L	50.	N/A	
ALACHLOR	NG/L	500.	35000.	(D2)
PROMETONE	NG/L	50.	52500.	(D3)
PROPAZINE	NG/L	50.	16000.	(D2)
PROMETRYNE	NG/L	50.	1000.	(B3)
SENCOR (METRIBUZIN)	NG/L	100.	80000.	(B2)
SIMAZINE	NG/L	50.	10000.	(B3)
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE	NG/L	10.0	N/A	
ANTHRACENE	NG/L	1.0	N/A	
FLUORANTHENE	NG/L	20.0	42000.	(D4)
PYRENE	NG/L	20.0	N/A	
BENZO(A)ANTHRACENE	NG/L	20.0	N/A	
CHRYSENE	NG/L	50.0	N/A	
DIMETHYL BENZO(A)ANTHRACENE	NG/L	5.0	N/A	
BENZO(E)PYRENE	NG/L	50.0	N/A	
BENZO(B)FLUORANTHENE	NG/L	10.0	N/A	
PERYLENE	NG/L	10.0	N/A	
BENZO(K)FLUORANTHENE	NG/L	1.0	N/A	
BENZO(A)PYRENE	NG/L	5.0	10.	(B1)
BENZO(G,H,I)PERYLENE	NG/L	20.0	N/A	
DIBENZO(A,H)ANTHRACENE	NG/L	10.0	N/A	
INDENO(1,2,3-C,D)PYRENE	NG/L	20.0	N/A	
BENZO(B)CHRYSENE	NG/L	2.0	N/A	
CORONENE	NG/L	10.0	N/A	
SPECIFIC PESTICIDES				
TOXAPHENE	NG/L	N/A	5000.	(A1)
2,4,5-TRICHLOROBUTYRIC ACID (2,4,5-T)	NG/L	50.	200000.	(B4)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000.	(A1)
2,4-DICHLORORPHENOXYBUTYRIC ACID	NG/L	200.	18000.	(B3)
2,4-D PROPIONIC ACID	NG/L	100.	N/A	
DICAMBA	NG/L	100.	120000.	(B1)
PICLORAM	NG/L	100.	190000.	(B3)
SILVEX (2,4,5-TP)	NG/L	50.	10000.	(A1)
DIAZINON	NG/L	20.	20000.	(B1)
DICHLOROVOS	NG/L	20.	N/A	
DURSBAN	NG/L	20.	N/A	
ETHION	NG/L	20.	35000.	(G)
GUTHION(AZINPHOSMETHYL)	NG/L	N/A	20000.	(B1)
MALATHION	NG/L	20.	190000.	(B1)
MEVINPHOS	NG/L	20.	N/A	
METHYL PARATHION	NG/L	50.	7000.	(A1)
METHYLTRITHION	NG/L	20.	N/A	
PARATHION	NG/L	20.	50000.	(B1)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
PHORATE (THIMET)	NG/L	20.	2000.	(B3)
RELDAN	NG/L	20.	N/A	
RONNEL	NG/L	20.	N/A	
AMINOCARB	NG/L	N/A	N/A	
BENONYL	NG/L	N/A	N/A	
BUX (METALKAMATE)	NG/L	2000.	N/A	
CARBOFURAN	NG/L	2000.	90000.	(B1)
CICP (CHLORPROPHAM)	NG/L	2000.	350000.	(G)
DIALLATE	NG/L	2000.	30000.	(H)
EPTAM	NG/L	2000.	N/A	
IPC	NG/L	2000.	N/A	
PROPOXUR (BAYGON)	NG/L	2000.	90000.	(G)
SEVIN (CARBARYL)	NG/L	200.	90000.	(B1)
SUTAN (BUTYLATE)	NG/L	2000.	245000.	(D3)
VOLATILES				
BENZENE	UG/L	.050	5.0	(B1)
TOLUENE	UG/L	.050	24.0	(B4)
ETHYLBENZENE	UG/L	.050	2.4	(B4)
PARA-XYLENE	UG/L	.100	300.	(B4)
META-XYLENE	UG/L	.100	300.	(B4)
ORTHO-XYLENE	UG/L	.050	300.	(B4)
1,1-DICHLOROETHYLENE	UG/L	.100	7.0	(D1)
ETHLYENE DIBROMIDE	UG/L	.05	.05	G)
METHYLENE CHLORIDE	UG/L	.500	50.	(B1)
TRANS-1,2-DICHLOROETHYLENE	UG/L	.100	70.	(D5)
1,1-DICHLOROETHANE	UG/L	.100	N/A	
CHLOROFORM	UG/L	.100	350.	(A1+)
1,1,1-TRICHLOROETHANE	UG/L	.020	200.	(D1)
1,2-DICHLOROETHANE	UG/L	.050	5.0	(D1)
CARBON TETRACHLORIDE	UG/L	.200	5.0	(B1)
1,2-DICHLOROPROPANE	UG/L	.050	6.0	(D5)
TRICHLOROETHYLENE	UG/L	.100	50.	(B1)
DICHLOROBROMOMETHANE	UG/L	.050	350.	(A1+)
1,1,2-TRICHLOROETHANE	UG/L	.050	.60	(D4)
CHLORODIBROMOMETHANE	UG/L	.100	350.	(A1+)
TETRACHLOROETHYLENE	UG/L	.050	10.0	(C2)
BROMOFORM	UG/L	.200	350.	(A1+)
1,1,2,2-TETRACHLOROETHANE	UG/L	.050	0.17	(D4)
CHLOROBENZENE	UG/L	.100	60.	(D5)
1,4-DICHLOROBENZENE	UG/L	.100	1.0	(B4)
1,3-DICHLOROBENZENE	UG/L	.100	130.	(G)
1,2-DICHLOROBENZENE	UG/L	.050	3.0	(B4)
TRIFLUOROCHLOROTOLUENE	UG/L	.100	N/A	
TOTAL TRIHALOMETHANES	UG/L	.500	350.	(A1)
STYRENE	UG/L	.05	140.	(D5)